Telephony

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MAKING PLANT WORK EASIER

By ROBERT DE VORE

IMPROVED tools and materials in recent years save time and labor in maintaining good telephone service

THERE is a noticeable trend in telephone plant toward the improvement of tools and materials, partly as a result of natural development and partly because of considerable thought along safety lines. The new tools that have been brought out emphasize the safety factor, combined, of course, with labor-saving.

Some companies did store this same labor-saving equipment for a year or two in order to give employment to more men, but the tools nevertheless are in standard use. In this connection we refer to the motor-driven digger, mounted on a heavy truck or tractor, which was also equipped with a boom or derrick to handle the poles.

One such digger in operation on city construction averaged, with 30-foot poles, ten poles set per hour. The poles were tamped later by a ground crew, although a truck has been developed which carries a compressor outfit with air-powered tamps.

The latest trucks for all-around construction are decidedly different from the old ones which had canvas tops and scattered boxes for tools and materials. Three and four-ton trucks are now in use with all-steel compartment bodies; all bins easily accessible from the outside; a separate closed-in cab for the crew; a powerful winch and boom for handling the heavy lifting, and a power take-up reel.

Individual paper cups and a large thermos jug solve the thirst question on hot days. Some cabs are equipped with telephones, to be connected to the line wires by a long jumper.

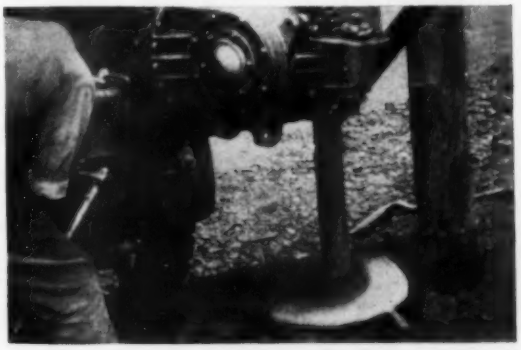
For those who want something lighter in weight and easier to handle than a set of rope blocks and tackle, there is a chain hoist which locks in operation and exerts an enormous strain in proportion to its size. A variety of sizes fit it to almost any requirement.

The old way of dead-ending messenger, using shim plates and jay hooks is giving way to an eyebolt, with a removable eye. One end of this eyebolt is bent at an angle to coincide with that of the down guy. Besides being easier and quicker to use, it results in quite a saving in material. A new clamp, made on a double-wedge principle, is being used for making running or straight splices in strand.

To overcome corrosion on strand, due to smoke and gases in some localities, a strand is being used which is coated with a layer of copper or rust-resisting metal that is not affected by atmospheric conditions. This may also be used in locations where the soil conditions cause an excess of oxidization. Metal cable rings in a variety of shapes and forms have replaced the old marlin hangers; and these are being improved so even that old enemy—ring cutting—will soon be a thing of the past.

In connection with cable, the old pure lead armor has almost disappeared. The sheath now contains a percentage of antimony or other hardening material, which gives a much longer life with freedom from crystallization. Changes have been going on under the armor, too. Conductors have been cut down to No. 24 and No. 26 gauge, which saves space and weight and also allows the use of more conductors in one cable. Nine hundred, 1,200 and 1,800-pair cables are in common use.

The conductors are insulated with very thin tough paper and, of course, are color-coded in groups. In some sizes of cables this paper insulation has been replaced with a



Motor-Driven Pole Digger, Mounted on Heavy Truck or Tractor, Speeds Up Plant Work. It is Equipped With a Boom or Derrick to Handle Telephone Poles.

wood pulp, tubular in shape, and molded on the wire, not twisted as is the paper. Addition of a small quantity of "splicing oil" to the paraffin used in boiling out is said to help materially in handling this new insulation.

In splicing, waxed cotton sleeves

Waxed Cotton Sleeves Are Now Used for Splicing Wires in Place of the Paper Sleeves Used for Many Years.

are now used in place of the paper sleeves used for so many years. They come in diameters ranging from ⅛ inch for 24 gauge conductors to double-walled ¼ inch used on larger toll conductors. The conductors in toll cables are quadded and transposed in groups, and are made up in Nos. 19, 16, 14 and 12 gauge. Sometimes these toll conductors are placed inside of a larger, small gauge local cable, called composite.

A popular pole terminal is made to fit flat on the pole, which allows the cable leg or stub to run up to the main cable in a way that gives maximum protection.

Where the cables are run through trees, a split wooden covering or moulding may be used to overcome damage from small limbs. Rings adjacent to corners and branch splices are replaced with a wire tie, placed over a protecting lead shim.

Drop wire has been improved to give longer service, and the insulation has been changed to better withstand weathering. One drop wire conductor has been coated with a non-corrosive metal, with a heavier braid; another has the two conductors, laid parallel to each other, under a single braid. One type employs a very heavy braid covering to protect against tree damage; another method is the use of a weatherproof braid over the drop where it may be in contact with limbs.

A metal, wedge-shaped clamp has been brought out to be used instead of ties on drop wire. It is said to be easy to apply and may be reused. There is also a metal clamp to use where the drop wire is supported from the messenger in the span, where tree clearance is desired.

The old method of stubbing or reinforcing poles was by wrapping the pole and stub with No. 6 wire. This method was rather unsatisfactory, partly because of the time involved and because it failed to provide the necessary strength to hold without slipping. Several new devices are used, most all involving a broad metal band or clamp used with long bolts and clamps which, by squeezing and pulling the slack out of the banding strip, hold the stub and pole firmly together. We understand these may also be reused, which effects an economy.

For making splices in open wire, some companies are using a new style sleeve, which is crimped on the wire rather than twisted, as is the case with the present sleeve. This requires a special tool. It is said to be quite simple and easy to use, and results in a splice that is less liable to corrosion and poor connections.

When it is desirable to have a substation protector mounted on the outside of a building, several weatherproof containers have been devised. Some have a metal container or box in which any style protector may be mounted, while others feature the protector and cover in one piece.

In general, the changes are the result of exhausting study with a view to permanently improving and maintaining service.

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Trustee Files Statement of Kansas United Companies

Another chapter was written in the complicated collapse of the C. L. Brown properties on March 31 by the filing in the federal court at Abilene, Kans., of the first report of the trustee in bankruptcy, C. A. Henry.

His statement shows that the United Telephone & Electric Co., the parent holding company, had 45 subsidiary companies. These have been reduced during the past year to 26.

The United Stores in bankruptcy were sold to W. O. Anderson of Topeka, the Ellis County Gas Co. was merged with the Central Kansas Power Co., the Sunflower Hotel Co., was turned over to the Abilene Hotel Co. and 11 telephone companies in Pennsylvania were merged in in one. Assets of the parent company were $22,781,750. The expenses have been reduced $3,500 a week by elimination of expensive employes; the profits last year were $659,242.

The parent company has claims against the C. L. Brown estate of $406,768 and against the Brown Memorial Foundation, which includes the park and home for the aged south of Abilene, of $94,441. All claims are in court and some are likely to be compromised.

Modern Construction Truck Has All-Steel Compartment Body, a Separate Closed-In Cab for the Crew and a Powerful Winch and Boom for Heavy Lifting.

The trustee says that 3,564 new telephone subscribers have been added, that earnings increased during the year $310,184 and $651,122 was available for dividends, an increase of $207,144.

When the various claims and debts are settled, the latter including $108,301 income taxes, $650,000 to the Southwestern Bell Telephone Co., $232,957 to the Indiana Bell Telephone Co., $65,700 to the United Trust Co. and $358,994 to various subsidiaries, a reorganization will take place.

HAND TOOLS Used in Outside Plant Work

By C. R. MOORE
Member, Technical Staff, Bell Telephone Laboratories, Inc.

HOW serviceability and efficiency of telephone hand tools used in Bell System plant work are determined in advance and readily checked by inspection during or after manufacture. View to right (Fig. 3) shows testing of linemen's climbers by subjecting the stirrup to a repeated downward thrust in this testing machine

TO BUILD and keep in order a plant as complicated as that of the Bell System, a great variety of tools are required. For outside plant use alone, several hundred different hand tools are needed, not to mention automotive and power-driven tools, and the system's investment runs into large figures.

Many of these hand tools are of familiar design but they differ from the ordinary commercial grades which can be bought in any hardware store. They are produced according to specifications which are the result of careful study from the standpoint of serviceability and efficiency and with the needs of telephone work in mind.

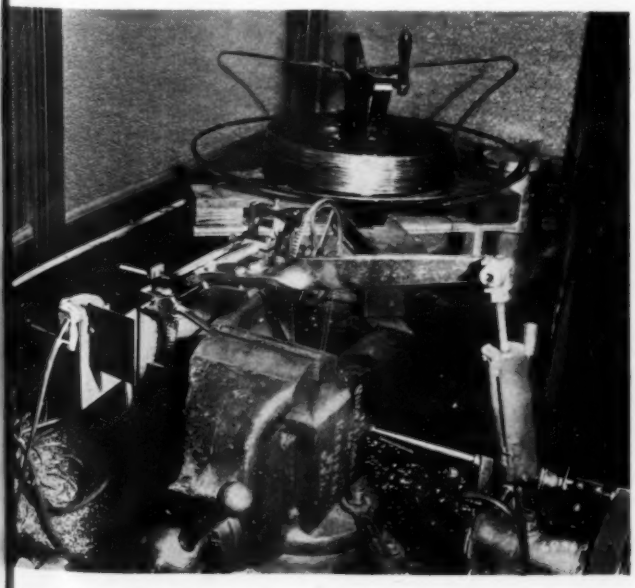
Laboratory tests are checked in most cases by field trials and the combined results are embodied in specification requirements of such a nature that they can be readily checked by inspection during or after manufacture. This procedure is justified from the point of view of efficiency and economy by the large investment of the Bell System in hand tools.

Pliers are representative examples of commercially available tools. In the development of specification requirements, samples are tested in our outside plant laboratory for characteristics that have been found to be significant, such as hardness, ductility and service life.

For the life test of side-cutting pliers, for example, the lower handle of the sample is clamped securely in a large vise and the upper end is attached to a long horizontal bar, Fig. 1. A small motor is connected to this bar by a crank mechanism which operates the plier handle about 40 times per minute.

Hard-drawn copper wire is fed automatically to the cutting edge of the pliers. When the plier breaks, or the cutting edges become dulled to the point where the wire is not cut through, the motor is automatically stopped. A counter indicates the number of operations.

The cable cutter, which is a shear used to cut lead cables ranging up to 2⅝ inches in diameter, is another



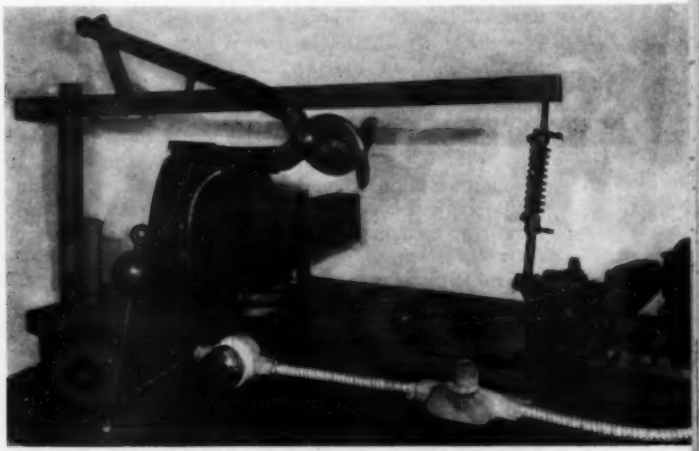


Fig. 1 (to the Left) Shows Equipment for Making Life Test of Side-Cutting Pliers, the Lower Handle of the Sample Being Clamped Securely in a Large Vise and the Upper End Being Attached to a Long Horizontal Bar. Fig. 2 (Above) Shows Cable Cutters Tested to Destruction by Making Them Bite Repeatedly Into a Large Brass Rod at the Rate of 40 Times a Minute.

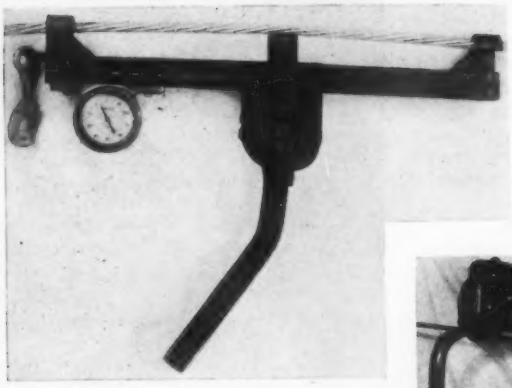


Fig. 4 (to the Left) Shows How the Tension of the Stranded Steel Wire Used as a Messenger to Support Aerial Cable or for Guying Poles Is Measured With a Strand Dynamometer.

example of a tool that must be designed to withstand repeated severe stresses. To insure proper choice of materials and design, sample cutters are tested in the machine shown in Fig. 2. The cutter is required to bite into a brass rod 40 times per minute until failure of the cutting blade or other part occurs. With comparative results from such tests, suitable grades of steel and shapes of parts can be specified.

To obtain a measure of the service life of the leg iron of linemen's climbers, a special testing machine has been designed, Fig. 3. It applies repeatedly a downward force to the stirrup, thus simulating the weight of the lineman, while the climber is supported at the top of the leg iron and the gaff. The machine is operated by a motor until the climber breaks, when the motor switch is automatically tripped. The number of repetitions is read on a counter.

The leg iron is tested for ductility by bending it half-way around a cylinder two inches in diameter. This severe treatment must be withstood without fracture. The gaff also must be sufficiently ductile to permit hammering the point half an inch toward the leg iron without signs of breaking. The hardness of both leg iron and gaff is determined by the Rockwell test. This consists of pressing a diamond point of definite size and shape against the surface by a known force and measuring the depth of the depression which results.

Problems of a different character are encountered in the development of special tools to fulfill specific needs. The shunt dynamometer and the cable car fall in this category. The shunt dynamometer measures the tension in the stranded steel wire used for such purposes as guying poles and as cable "messenger" wire.

It is important that the tension in this "messenger strand" be held between fairly definite limits. While the tension must be adequate to limit

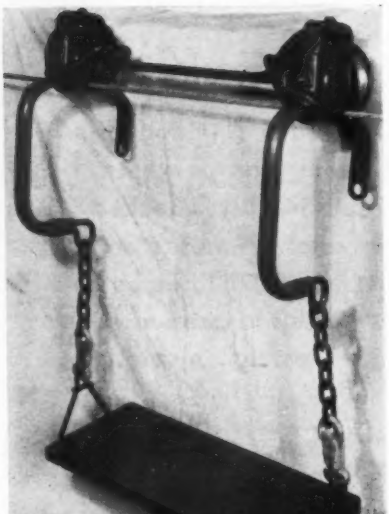


Fig. 5. The Construction and Maintenance of Aerial Cable Frequently Requires That Workmen Ride a Cable Car.

sag and maintain clearances, excessive tension would aggravate bowing of the cable caused by the difference in the expansion, with rising temperature, of the cable and the supporting strand.

The dynamometer operates on the principle that the force required to thrust a given length of supporting strand aside may be used as a measure of the tension in the strand. The instrument, Fig. 4, consists of a rectangular steel bar split lengthwise to the center and provided with a hook at each end to fit over the strand. At the mid-point, there is a cam handle which operates a plunger. This applies lateral pressure and bows both the strand and the upper bar of the dynamometer an amount which depends on the tension of the strand. The bowing of the dynamometer bar is measured by the dial gauge attached to the lower bar.

A calibration is made by noting the readings of the gauge for each size of strand under measured tensions. These data are plotted and supplied with the instrument to enable the operator to convert the dial readings into tension in pounds.

In the construction and maintenance of aerial cable, it is necessary to work along the supporting strand. For this purpose, a small trolley-like vehicle called a "cable car" is provided. In its latest form, Fig. 5, it consists of a light steel frame mounted on two rubber-tired wheels and supporting a wooden seat by means of short chains and snap hooks.

The height of the seat may be adjusted to suit the workman. A strap, which is threaded through the D ring in the workman's belt, is attached to the eyelets below the wheels to protect him from falling. Rubber-tired wheels are provided so that the cable rings will not be pushed along the strand, experience having shown that the relatively soft rubber will yield to the ring and ride over it.

In addition to these more obvious points, great care was exercised to embody in the design safety features that are only apparent on detailed study. For example, the snap hook had to be redesigned in relation to the chain link it engages so as to make it impossible for the chain to be accidentally disengaged from the hook.

As the cable car must be manipulated aloft by the lineman, Fig. 6, weight is an important consideration and every effort was made to reduce the weight to a minimum consistent with strength and safety.

The care taken in working out these details in special tools and the thoroughness of the tests made on commercial types are indicated by the few examples given here. That these efforts are justified is shown by the notable improvement in the efficiency and life of many telephone plant tools resulting therefrom.

Fig. 6. Telephone Workman Engaged in Riding Messenger Strand.

Modern Line Construction Truck

By RAY BLAIN

WHAT ARE your ideas of equipment that should be found on a truck designed for use in construction work? In this article are found suggestions and comments concerning line trucks which are made as a result of actual experience and observation

IT IS DIFFICULT to believe, though quite true, nevertheless, that many telephone companies still fail to realize the numerous advantages which may be gained from the use of a properly-designed and well-equipped line construction truck.

In our opinion, no telephone company which maintains 1,000 or more telephones, can well afford to be without one of these modern trucks, if good service is to be provided subscribers, with a reasonable profit to the company. When one notes the makeshift trucks and equipment often used by some companies, it is not at all surprising that they may continue to consume red ink in excess quantities for some time to come.

The modern line construction truck, if properly equipped, is virtually a machine shop on wheels. This arrangement not only saves labor and money, but also permits a much better grade of work to be performed on all types of construction, with greater ease, safety and speed.

A properly-equipped truck, as referred to in this article, is one with a winch, pole derrick, power reel and suitable compartments for all small tools. A cable-reel trailer, a cable-splicing trailer and a pole cart will complete the outfit. The cable-reel trailer and the pole cart may be combined if considered desirable. The line truck should always be provided with a suitable pintle for attaching the trailers.

The size of the truck will, of course, depend to a great extent upon the nature of the work to be performed. The average telephone company can use to advantage a 1½, or 2-ton truck with dual tires in the rear. This truck should be provided with a good cab in which the driver will be comfortable during all kinds of weather.

The comparatively new, seven-man cab has the advantage that it protects the entire crew, as well as the driver, from inclement weather.

Use of Small Gin Pole With Winch When Pole Derrick Is Not Available.

This type cab usually accommodates three men in the front seat and four in the rear. It also provides an ideal place for the crew to eat lunch during the noon hour and, in severe weather, eliminates the necessity of a trip to the nearest restaurant or other suitable shelter. In our opinion, all cabs should be heated, and equipped with safety glass throughout.

The body of the line construction truck should have necessary tool compartments on either side within convenient reach of the ground. These compartments should be equipped with necessary bins and racks to keep the various tools within easy reach and in proper order. The ability to locate any one of several hundred tools instantly saves considerable time daily.

Adequate racks should be provided above the tool compartments to carry the necessary ladders and pike poles. A suitable compartment with clamp hold-downs should also be provided to carry the pole derrick.

The rear end of the truck body should be provided with some arrangement in order that a vise may be easily and quickly attached.

Necessary fixtures should be provided so that a bar can be inserted to extend across the body at the rear. This bar should be equipped with center supports and a sheave wheel about eight inches in diameter. Numerous advantages may be gained by providing an arrangement whereby this bar and sheave wheel can be shifted to the top of the truck. The sheave is necessary to guide the winch line on different types of work, and for the raising and lowering of the pole derrick.

The top of the truck body should be provided with either a canvas or a sliding metal cover. This cover should be waterproof, so as to keep the interior of the truck dry and, at the same time, be easily removable when the pole derrick is raised.

If it could be said that any one feature of a line construction truck has the greatest value, perhaps the winch would easily claim all honors. The average winch ordinarily used on a telephone construction truck has a lifting capacity of from 5,000 to 10,000 pounds.

A telephone winch should always be equipped with a drum which will accommodate about 1,000 feet of ⅜th-inch yacht rigging for use as a winch line. This length will frequently be required when pulling-in underground cable. A small additional drum, which will hold about 200 feet of line, will prove its worth on numerous small jobs, and will greatly lengthen the life of the long line.

In the author's opinion, a clutch is necessary on a winch used for telephone construction. This permits the drum to roll free when hauling

At Left Is Shown View of Pintle, Cross-Bar With Sheave and Protectors for Points on Pike Poles. Photograph Below Shows Use of Dual Tires to Tamp Conduit Trench. View to Right Shows Bar in Top Position Being Used to Raise Pole for Loading Onto the Truck Trailer.

the winch line into a duct run for pulling underground cable. When the clutch is not provided to release the drum, it will be necessary to run the motor of the truck to take the line from the drum. This clutch cannot be released under load, so is absolutely safe.

The modern winch is also equipped with an automatic worm brake which permits reversing the winch with suspended load. This brake acts only when the winch is brought to a standstill, and releases only when power is applied in either direction.

The power take-off to operate the winch should utilize all speeds available in the truck transmission for operating the winch in either direction. With this arrangement, all power of the motor may be transmitted to the winch, thus eliminating the necessity at any time of racing the motor.

The pole derrick should always be regular equipment on any telephone line construction truck. The derrick removes practically all danger from pole setting, permits the use of a much smaller crew, and speeds up the work in general.

The derrick may also be used for pole pulling by placing the center leg on a foot plate near the pole being pulled. Using this method, a pull of approximately 12,000 pounds may safely be placed on a medium-size derrick, which is usually sufficient to pull the average telephone pole. When making a heavy pull on a pole derrick, supporting jacks should always be used on the rear of the truck body to protect the springs.

The pole derrick may also be used to advantage in lifting and moving heavy objects, such as cable reels. The ordinary pole derrick will usually handle an average 50-foot pole and, when proper methods are observed, the same derrick may be safely used to set a 65-foot pole. When a longer pole is to be set, a gin pole is ordinarily used. The pole derrick will be adequate to set a gin pole which will handle up to a 100-foot pole. Seldom will it be necessary to set one of a greater length in present-day telephone work.

A collapsible power reel should always be provided, for it is most useful in taking down heavy wire or messenger and winding it in neat coils. Removal of the coils from the reel is accomplished by rotating the handle on the outer end of the reel which causes it to collapse.

This reel is also most useful in pulling-in aerial cable. A No. 9 steel wire can be placed inside the cable hangers as they are installed on the messenger. This wire is then coiled on the power reel as the wire is pulled-in. With proper lubrication,

Using Nigger-Head on Line Truck. To Right Is Cable-Splicing Trailer With Gas Tanks for Testing Mounted On Top.

Nigger-Head and Slip Used to Backfill Conduit Trench. Rolling a Pole Up the Skid and Onto the Trailer by Means of Winch Line.

Recovering Messenger With Power Takeup Reel. View on Right Shows Use of Winch Line in Pulling-In Underground Cable. View Below (To Left) Shows Workmen Engaged in Raising Pole Derrick; Note That Cross-Bar Is in Upper Position. View to Right (Below) Shows Men Engaged in Moving Pole With Derrick.

cable up to 100 pairs in size may be pulled-in with absolute safety, using the No. 9 steel wire.

Various types of all-steel take-up and pay-out reels may be mounted on the truck for use with drop wire. These reels may also be demounted and used outside the truck, in either a vertical or horizontal position. Some reels of this type are equipped with a variable tension brake, which may be utilized in reducing and controlling the speed of the reel when paying out wire.

A detachable nigger-head for the construction truck may be used to advantage on various kinds of work. This nigger-head attaches to the end of the winch shaft and extends outside the truck body.

This equipment may be used to advantage in backfilling conduit trench. A rope is attached to an ordinary dirt slip or scraper, run through a snatch-block on the rear of the truck, then forward and given several turns around the nigger-head. One man holds the slip and another handles the rope around the nigger-head, which is loosened when the dirt is dumped into the ditch. The slip is then dragged back by hand for another load.

It is surprising the ease and speed with which trench may be filled by this method. An iron pipe with a clevis attached may be inserted in the brackets to replace the sheave bar and hold the snatch-block in the proper position at the rear of the truck.

The handling and hauling of long poles always presents numerous problems. We believe the best method by which this can be done is to make use of a pole cart or trailer. The poles may be lashed and balanced on the trailer with the middle one forming an extra long tongue for the trailer.

An approved type draw-bar is used to attach the trailer pole tongue to the pintle of the truck. This draw-bar has two chains which clamp around the pole near the end, holding it firmly without damage. The springs of the modern pole trailer are under-slung, providing a convenient, low-loading height.

Poles may be loaded on the trailer with the pole derrick, or rolled-up a skid with the winch line. In some cases the sheave bar may be placed in the upper position and used to raise a pole to a height sufficient for loading on the trailer.

The all-metal, insulated water cask is a necessity on any line construction truck, as it best solves the problem of providing pure, fresh drinking water at all times for the crew. These casks are constructed entirely of metal, with each seam or joint welded.

The insulated chamber between the outer and inner shells, cuts down the heat transference, and drinking water keeps cool and fresh the entire day, regardless of the most severe summer heat. The inside is lined with a blue vitreous enamel, sanitary as glass. These casks come in two, three and five-gallon sizes and may be conveniently mounted on a front fender by making use of a special bracket and clamp which may be obtained with the cask.

Sanitary drinking cups in a holder is a worth-while addition to any truck, and provides a further insurance for the good health of the crew.

A complete first-aid kit should always be provided and installed in a suitable holder at some convenient location in the cab. Care should always be taken to keep this kit well stocked, in order that it may be available for instant use in case of an accident.

A set of six good pike poles and a safety type extension ladder, of suitable length, should also be mounted in the racks provided on the truck. These should all be well sanded and treated with a good weather-proof varnish. Neither ladders nor pike poles should ever be painted, as this increases their weight considerably, and may possibly decrease their strength. Did you ever see a ladder used by any fire department?

If the ladders or pike poles have a tendency to chatter in the racks, it may be prevented by clamping them down with a short piece of strap with a buckle on one end. Some of the later types of trucks are provided with a special clamp which holds the ladder firmly in the racks.

Using Derrick to Set Poles. Note That Supporting Jacks Are Not Used on Rear of Truck and That the Pole Being Raised Is Not Overly Heavy.

In addition to the various tasks usually performed with a line construction truck, we have found numerous special jobs which can be handled to advantage by making use of the regular equipment.

Our success has been complete on pushing pipe with the winch method described in detail in TELEPHONY of October 10, 1936. Just recently we pushed two 2-inch pipes for a distance of 55 feet under a concrete highway and they both came out within a few inches of where they were aimed.

We also find that the dual tires are ideal for tamping trench after conduit has been placed. We first fill the trench with the slip and then drive over it several times with the dual tires. When it is smoothed out with a garden rake, the landscape is back in its original form, with practically no surplus dirt in evidence.

We also have a well-equipped cable-splicing trailer with gas tanks for testing, mounted on top. This small trailer is always mounted on the cable-reel trailer for transporting long distances. The pole derrick provides a convenient means of loading the small trailer.

We have now graduated from the

solid tire class and have everything equipped with pneumatics. These tires are much easier on the equipment and conform to all state highway regulations. They are also much safer and convenient to use when crossing sidewalks, lawns and curbs, which is sometimes necessary on underground cable work.

So satisfactory has our experiences been with our line construction truck that we are of the firm opinion that no telephone company with any amount of plant to maintain, can well afford to be without one. Many difficult jobs, which we at one time dreaded, are now faced with confidence and pleasure. Neither have we injured a single man since acquiring the truck, and we have set several 100-foot poles, weighing over 5,000 pounds each. The matter of safety in use is important.

Anyone charged with the responsibility for good line construction, at a cost within reason, will do well to investigate the possibilities of the modern telephone line construction trucks and their auxiliary labor-saving equipment. They are efficient.

Stopping Flood Damage to Exchange

HIGH WATER of March, 1936, damaging telephone power equipment in Hartford, Conn., brings about program to place all equipment beyond reach of possible future floods. Steps taken assure continuous supply of current for operation of central office equipment to prevent future interruptions from floods

THOROUGH measures have been undertaken by The Southern New England Telephone Co. to prevent a repetition of its flood troubles at Hartford, Conn., where unprecedented high water in March, 1936, submerged telephone batteries and power equipment and cut off the outside power supply.

The 1936 flood waters entered both of Hartford's two downtown telephone buildings, which are located on opposite sides of one of the city's streets. One building, completely surrounded by water, was accessible only by boats until a catwalk bridge was erected to connect it with the other building across the street. Since this experience, a permanent bridge has been erected across the street between the buildings as one feature of the extensive program to prevent flood damage.

Besides giving access to the lower building in case of flood, this bridge will carry power cables and will make it possible to consider the two buildings as one, insofar as power requirements are concerned. Provision has also been made for telephone tie cables in this bridge, and for the possibility of tying together the heating plants in the two buildings.

The bridge is related to the general program of removing all power equipment to a point beyond the reach of future floods. Batteries and power equipment, previously located in basements of the two buildings, are being moved to upper floors, and a building addition has been erected to house transformers at a height above flood levels. In addition to these relocations at higher levels, other measures are being taken to prevent water from entering the building which last year was isolated.

The power equipment affected by the 1936 emergency served all local exchange telephone plant in downtown Hartford, the toll switchboard, and telephone and telegraph repeaters of the American Telephone & Telegraph Co. In the basement of one building, known as the Pearl Street building, were the following major units:

A 24-volt, open-tank type battery rated at 4,160 ampere hours, which supplied for the most part the filament current requirements of the long lines repeater station on the second floor.

A 48-volt, open-tank type battery rated at 7,360 ampere hours, which furnished current for four step-by-step dial units.

Miscellaneous batteries in open and closed type glass jars, consisting of message register batteries at 65 volts; grid batteries at 10 volts; batteries for metallic telegraph at 34 volts, and batteries for telegraph and voice frequency repeaters at 130 volts.

Other power plant equipment consisted of control, charging and fuse panels, together with battery-charging units which included various types of rectifiers and motor generator sets.

A ringing power plant, consisting of duplicate ringing machines and associated control and fuse panels, furnished all ringing power, tones, signals and

When the Street Separating Hartford's Downtown Telephone Buildings Became a Canal in the 1936 Flood, Rowboats and This Temporary Bridge Provided the Only Means of Access to One of the Buildings.

To the Left Is Shown the New Bridge Now Connecting Hartford's Two Downtown Telephone Buildings Which Were Flooded to a Height of Eight Feet in 1936. Power Cables Are Now Carried on the Bridge at a Height Well Above Any Conceivable Flood Level. The Illustration to the Right Was Taken Near the Crest of the 1936 Flood. Submerged Windows in the Building to the Right Are Those of One of the Telephone Company's Power Rooms. The Building in the Left Foreground Is the Trumbull Street Telephone Building.

coin control current for this building.

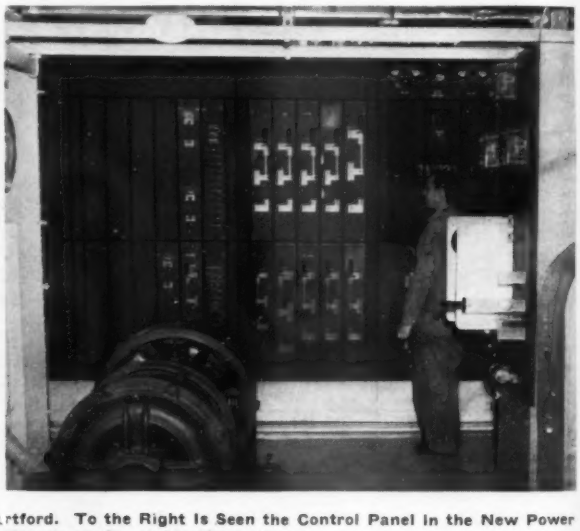
The other basement, in the Trumbull Street building, contained the following major units:

A 24-volt plant, which furnished current to the local company's toll switchboard and to the long lines department's equipment in this building. The batteries of this plant were rated at 8,000 ampere-hours' capacity.

stored to service as quickly as possible, has supplied power since the flood. Meanwhile, a complete new 48-volt plant, which was ready for service on March 1, 1937, was installed on the third floor of this building. It includes the latest type of charging and control equipment, enclosed glass batteries, and aluminum bus bars throughout. This equipment now serves four dial units, with provision for additional batteries and charging machines to care for a fifth unit.

moved up from the basement, but all battery equipment will be new, of the enclosed glass jar type, mounted on metal racks.

All electric service for both buildings, before the flood, was furnished by duplicate sets of feeders, terminating in a vault in the Trumbull Street basement, where transformers converted the 4,800-volt power to 220-110 volts for telephone power and lighting in the building. Duplicate sets of 4,800-volt tie feeders extended to a transformer vault in the Pearl Street basement, where the current was converted to 220-110 volts for the entire needs of that building.



General View of New Storage Batteries and Power Equipment at Hartford. To the Right Is Seen the Control Panel in the New Power Room at the Southern New England Telephone Co. at Hartford, Conn.

A 130-volt power plant for repeater plate supply, included duplicate glass jar cells rated at 160 ampere hours.

A small 48-volt plant provided current at this voltage for miscellaneous circuits.

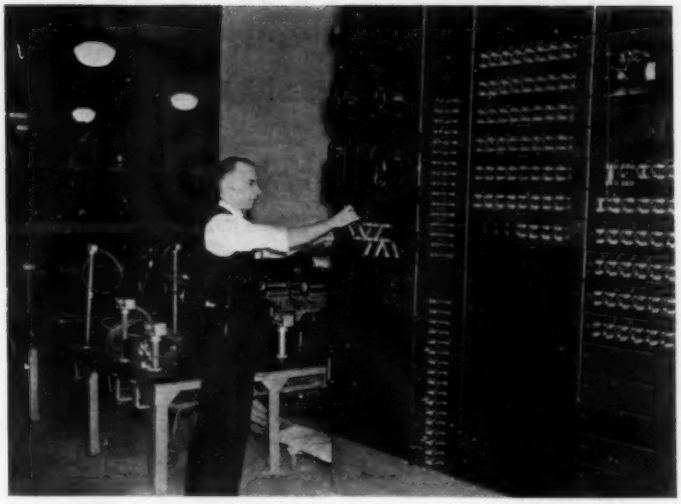
A ringing power plant, consisting of two ringing machines, together with associated power panels, furnished ringing power, tones and signals for the Trumbull Street building.

The Pearl Street equipment, re-

The 24-volt plant and the 130-volt and miscellaneous units will be located on the third floor of the Trumbull Street building. Some charging generators and control panels will be

Under the new arrangement, both

To the Left Is Shown an Inside View of the New Bridge Between the Hartford Telephone Buildings, With Power Cables Placed Overhead, Well Above Any Flood Level. To the Right Are Shown the Storage Batteries in Use at Hartford Before the 1936 Flood. These Were Submerged by the High Water and Were Restored for Use Pending the New Installation on an Upper Floor.



Ringing Control and Fuse Panel in the New Power Installation at Hartford, Conn.

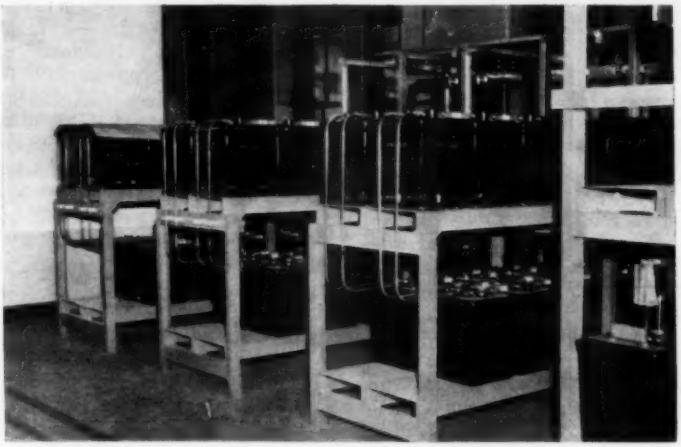
floors, if these should again be flooded. While the Trumbull Street transformer vault would likewise be flooded in this event, an emergency set of leads from the new transformer room will be available to pick up lighting and kitchen power leads on an upper floor.

With all telephone power equipment above the flood level, a continuous supply of current for operation of the central office equipment is contingent only upon the stability of service from the local electric company. This company has made changes at its plant to prevent future interruptions from floods.

As a further safeguard, the telephone company has ordered a 75 K V A direct-connected, gasoline-driven alternator, which will be located at Hartford and will be available for emergency use at other large

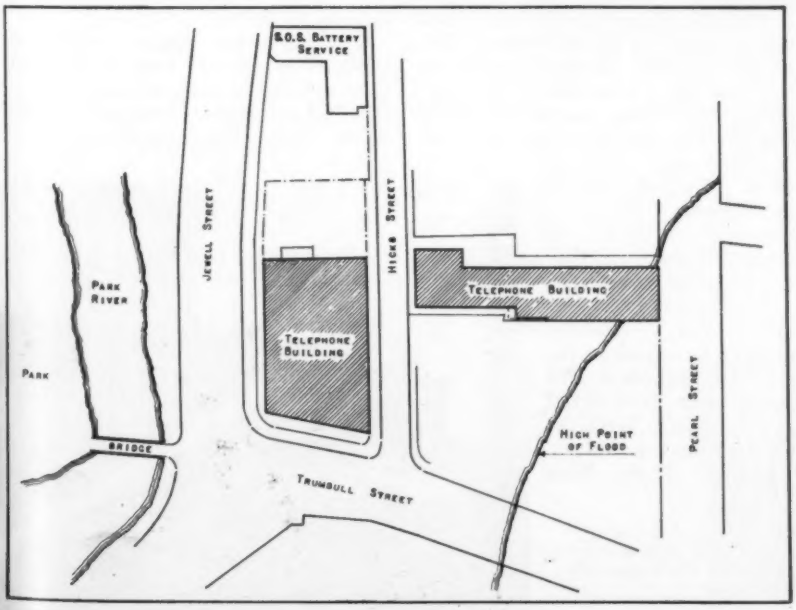
regular and emergency feeders will extend to transformers in the elevated Pearl Street addition, supplying light and building power for that building, as well as current for all telephone power equipment in both buildings. The existing duplicate set of tie feeders will carry the high-tension power to the Trumbull Street building, where another set of transformers will supply the lighting and building power.

Provision has been made for opening the electric light risers in both buildings so that the upper portion may be lighted, independent of lower



The New 48-Volt Storage Battery Installation at Hartford.

Diagram Showing Flood Conditions Around the Downtown Offices of the Southern New England Telephone Co. in Hartford, Conn., Last Year.

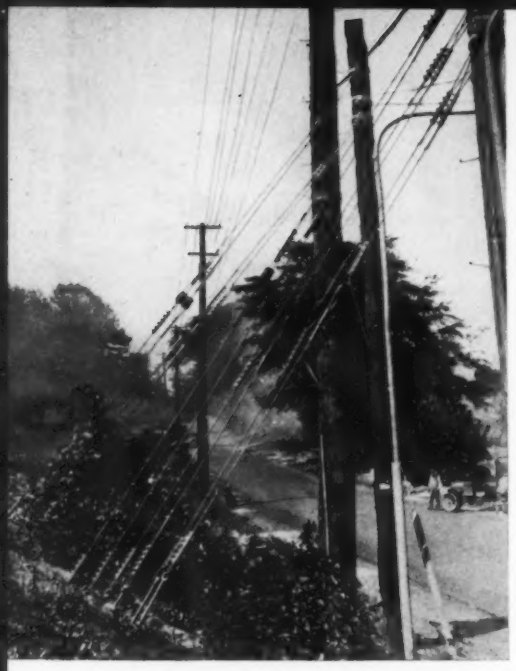


offices in the territory of the company.

With respect to keeping water out of the buildings in case of future floods, experience in 1936 showed that the Trumbull Street building withstood the pressure satisfactorily until the water reached a height several inches above the first-floor window sills and overflowed the barricades. A check indicates that the floor and walls will be amply safe, even though water outside the building reaches a height of 41.5 feet.

In view of this, double-thick wooden bulkheads, lined with waterproofing and reinforced with angle irons, are being constructed for all window, door and louvre openings in the first floor and basement. These can be bolted in place whenever floods threaten in the future. Other basement openings for pipes, ducts, sewers, etc., have been made tight or fitted with valves for this purpose.

(Please turn to page 32)



GUYING THE LINE

By ROBERT W. SAVAGE

GUYS ARE IMPORTANT FACTORS in reducing the maintenance of open-wire or cable leads. Fundamental information regarding guying with specific details for placing and fastening guys which will interest the practical telephone man. Illustration to the left shows multiple guys on a cable pole of a long span

AS A CHAIN is no stronger than its weakest link, neither is a pole stronger than its weakest guy, for no matter how strong poles may be they cannot be expected to hold a heavy strain on a corner or a deadend without adequate guys.

A lead of either open wire or cable just cannot be expected to stand and give good service unless it has a sufficient number of strong guys properly placed. In the planning of all new construction care should be taken to always provide adequate guys, for otherwise increased maintenance charges will probably offset any savings in first cost.

In the installation of guys two factors should always be considered —"lead" and "height." The "lead" is the distance measured horizontal from the butt of the pole to the anchor, on level ground. When the anchor is lower than the pole, as on a side hill, then the measurement should be to the guy strand. This measurement should include the width of the pole.

The "height" is the horizontal distance from the ground level to the point where the guy attaches to the pole. The following calculation should be used in the design of any system of guys:

$$\text{Lead} = \frac{\text{Horizonal distance to guy.}}{\text{Height of guy attachment.}}$$

$$\text{Lead} \frac{12}{18} = \frac{2}{3}$$

Here we have a lead of 2/3 when the anchor is placed 12 feet from the pole and the guy is attached to the pole 18 feet above the ground level. Should the anchor also be placed 18 feet from the pole, in this case we would have a lead of one. That is considered an ideal condition to carry maximum strain although space will not ordinarily permit its use.

In no case should the "lead" of a head, or deadend guy be less than one-third. The "lead" on a corner guy should never be less than one-third for a heavy cable or open-wire line.

The "pull," as defined for some guy calculations, is the distance a corner pole is set out of line between two points—each 100 feet from the corner pole and in line with the corner and the adjacent pole—without considering the length of the spans.

All approved type anchors are considered suitable for guy anchoring. The best type to use will depend primarily upon local soil conditions. Due to the expense of installing the old log anchor, it is seldom used in preference to modern patent anchors.

The size of guy strand to use will depend upon the strain involved. The strand is usually attached to both the pole and the anchor rod with standard three-bolt guy clamps. Generally one clamp is used on 6-M strand, two on 10-M and three on 16-M. Seldom will it be necessary to use a greater number of three-bolt clamps if they are properly installed.

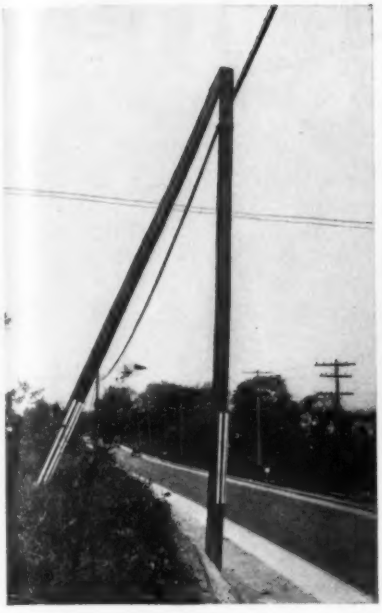
In the old days guys were always attached to poles by wrapping the strand around them. The strand was prevented from cutting into the wood by placing "shims" under it. These shims were generally made by cutting crossarm braces into lengths of about eight inches and drilling holes through each end for nailing them to the pole. Then lag screws were driven into the poles to prevent the guy wire from sliding down.

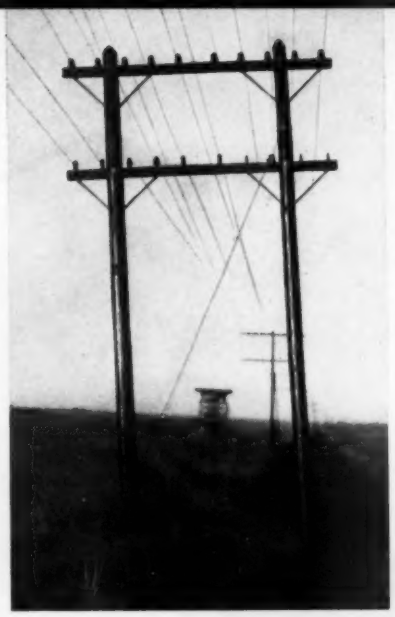
Storm guys were generally just wrapped around the poles without any protection, due to the fact that they ordinarily carried very little strain and did not cut into poles to any great extent.

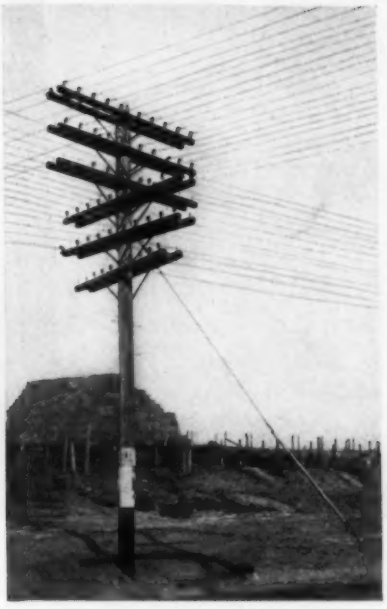
The next worthwhile improvement was the use of strain plates to replace the shims. These consisted of heavy sheet metal strips about 4 ins. by 8 ins. with a hole drilled into each corner for attaching to the pole with nails. These plates were considered a big improvement as they had a much greater bearing surface than shims and were much easier and quicker to install.

The lag screw support was also replaced by the "J" hook which was attached to the pole, usually with a bolt but sometimes with lag screws. These hooks had greater strength

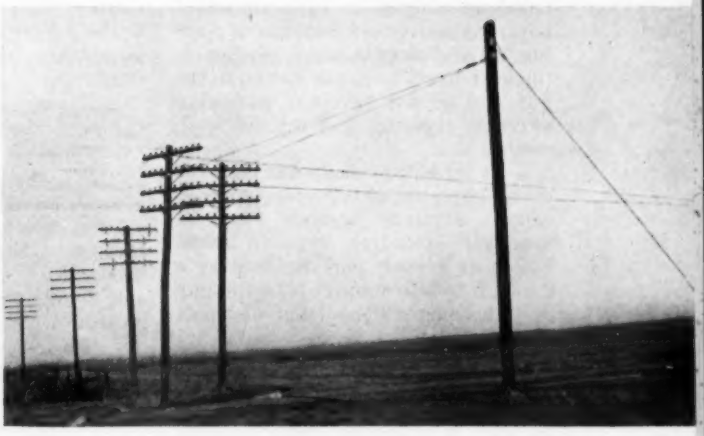
Workman Engaged in Installing a Guard on a Guy.



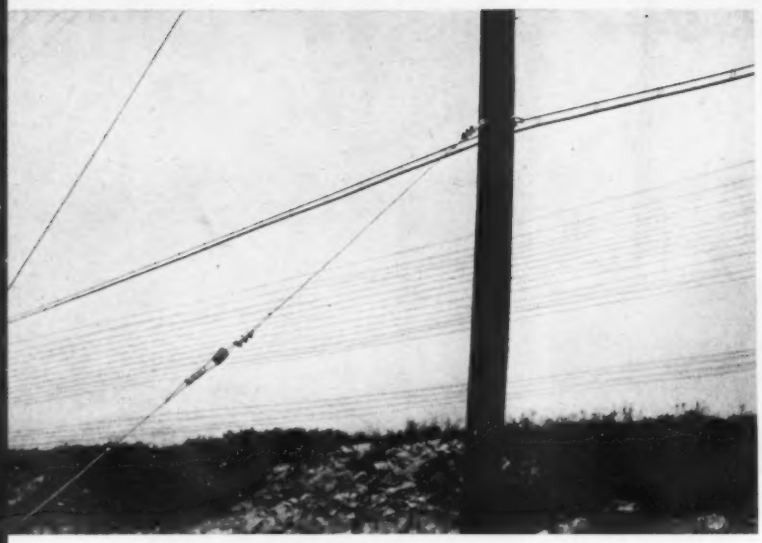


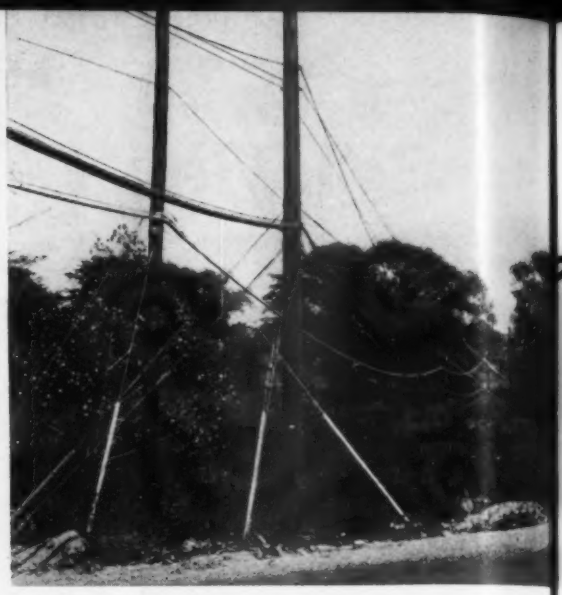


Photograph to Left Illustrates the Use of a Pole Push Brace. Above Is Seen an Example of Special Guying Using an H-Fixture. View to the Right Shows the Guys Used on a Buck Arm Pole.



Above Is Seen a Lead Around a Curve Guyed Across the Road by Means of Stubs. To the Right Is an Illustration of Guying for a Right Angle Corner on a Toll Lead. Below (To the Left) Is Seen a Total of 14 Guys on One Guy Stub. To the Right Is Shown an Example of Guying for a Special River Wire Crossing.





To the Left Is Shown an Eyebolt Used as a Through Bolt for Cable and a Guy Support. Above Are Shown Special Guys on a Long Cable Span.

and did a better job of supporting the guy.

While strain plates are still extensively used, they are gradually being replaced with eyebolts. These bolts are claimed to have numerous advantages over old methods of guying. They carry a large amount of the load direct from the strand to the guy and do not have the squeezing effect on the pole that the old wrap method did.

Bent thimble eyebolts are used for down guys on either open wire or cable. Straight eyebolts may be used for extending guys to studs. A bent eyebolt may be used as a through bolt to support both the guy and the suspension clamp on cable construction.

Eyebolts may ordinarily be obtained in 5/8-inch and 3/4-inch diameters. Eyenuts are required to be used in connection with eyebolts for deadending cable suspension strand. Cupped washers to fit the pole may also be used to advantage.

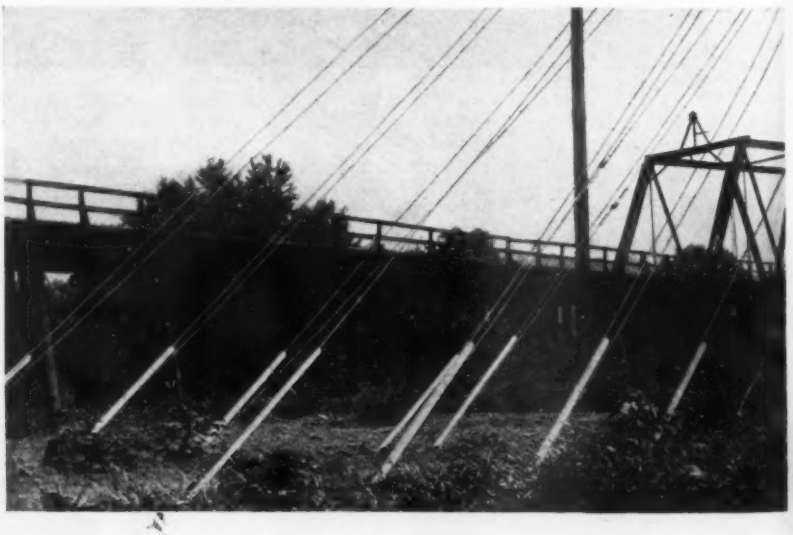
A modification of the eyebolt method is a guy loop formed somewhat like a "U" bolt. This loop has a saddle plate which fastens to the pole with lag screws, and the U-bolt extends through it and the pole. Deadend thimble eyes which attach to the pole with bolts may also be obtained for guys which carry less strain.

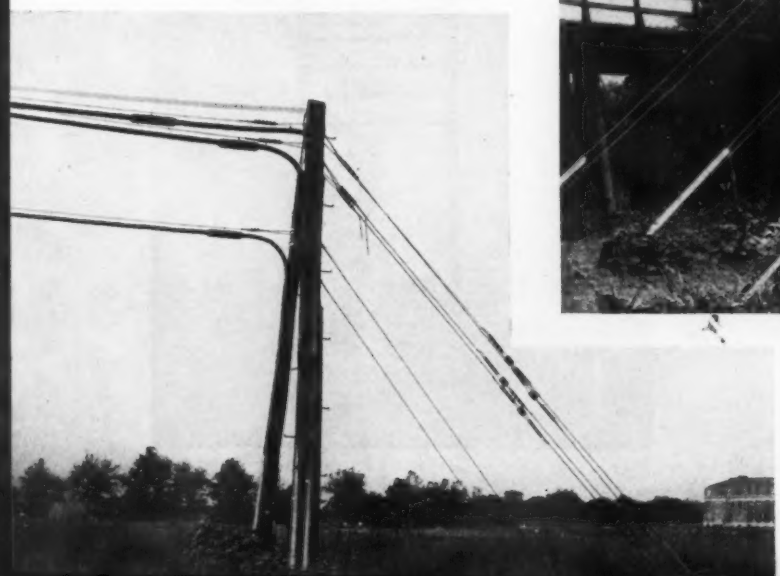
Strain insulators should ordinarily be placed in all grounded and exposed guys or those within eight feet of the ground. When the length of a guy is sufficient, a top strain insulator should be placed about seven feet on a horizontal line from the pole, and a second and lower one about nine feet from the ground, measured on a vertical line. When insulators so placed would come within about eight feet of each other, the lower insulator is usually considered to be sufficient.

Overhead guys, when considered exposed, should have a strain insulator cut in about seven feet from the pole and about the same distance from the stub pole. Guys exposed to accidental contact with power, light or trolley wires having more than 300 volts to ground are ordinarily considered exposed.

Guys may be attached to buildings when they happen to be located properly with adequate clearance and permission is obtained for their use. Guys may also be attached to trees

(*Concluded on page* 32)





To the Left Is Shown an Example of Cable Guying Illustrating the Use of Strain Insulators. The Photograph Above Shows Use of Multiple Guys for Supporting a River-Crossing Pole.

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(*Concluded from page 28*)

although this is not ordinarily considered desirable. A guy may be attached to a tree by boring a hole through it and using an eyebolt.

When permission cannot be obtained to use this method, then the guy strand must be wrapped around the tree. A sufficient number of hardwood blocks should be placed under the strand to prevent damage to the tree. If this precaution is not taken, a growing tree will soon completely cover the strand.

Pole push braces are not now ordinarily used except as a substitute for guying when there is not sufficient space to install guys with proper "lead" or where the nature of the right-of-way is such that suitable anchorage for guys cannot be obtained. Push braces may also be used to strengthen poles in swampy locations.

Poles used for braces should be straight and solid and free from all defects which might reduce their strength. The top dimension of a pole brace should not be less than that of the pole they brace. When possible braces should be set with a "lead" of one-half and never less than one-third. The main pole should never be cut where the push brace attaches to it. The brace should be framed to fit the pole, and then attached by placing a bolt through both of them. A bolt is also usually placed through the end of the brace to prevent splitting.

When two cables are supported on the same pole they are generally guyed separately. When open wire and a cable are both on the same pole, one guy may be sufficient although two are generally considered better. When a lead carries two crossarms of wire, one guy is generally sufficient. Sometimes one guy is used to handle a four-crossarm lead, but ordinarily a second guy is installed for anything over two crossarms.

Guy stubs should be used when it is necessary to elevate guys above obstacles or to prevent them from obstructing streets or alleys. Good, sound, heavy poles should always be used as guy stubs, and they should never be of a height greater than necessary to provide proper clearance.

The pole used as a guy stub should be roofed in the same manner as the poles in the line. This roof should be in line with the overhead guy to the pole. The stub should be set to the specified depth for a pole of its length and should ordinarily have maximum "rake," which is usually about one inch for each foot of its length.

In sections of the country where the sleet load is likely to be heavy, each tenth pole is generally storm guyed. These guys are usually placed four ways on a pole and often are the means of stopping a sleet break. Ordinary down guys are generally used for storm guying but frequently one guy stub must be used when the main lead is too near a road or street for straight guying.

The H-fixture is often used for storm guying on important and heavy toll leads. This fixture is also sometimes set with a rake and one down guy and used for curves on heavy toll leads.

When extra high poles are introduced into a line for any reason, these poles are generally guyed in four directions. This applies especially to long spans over rivers, railroads or streets.

When extra long cable spans are placed, special guying is usually necessary. Extra guys are placed on the two poles of the long span and a second messenger, attached to the poles considerably higher than the regular cable-supporting strand, picks up the long span in its center.

When guys are so located that persons, livestock or automobiles may come into accidental contact with them, they should be made more visible by the installation of suitable guards. Approved type guy guards of metal or wood may be purchased at a reasonable cost. When regular guards are not available and appearance conditions permit its use, a crossarm or board may be wired to the guy for protection.

Care should always be taken to provide ample guys to carry the strain with provisions to handle an excessive overload which may be caused by sleet. This is especially true of open wire. It is always better to install a few guys more than are actually required than to lose an important corner. Six guys on one pole are not uncommon, while the author has seen a total of 14 on one guy stub. This was on a joint lead and the guys supported a long span of both cable and power feeders.

Space will not permit covering all phases of guying. An attempt has been made, however, to cover the parts which may be of interest to the average telephone man. Everyone may not agree with some of the methods described although they have all been tried somewhere, some time and found satisfactory under normal conditions.

It is believed that practically any one of these ideas may be revised to meet satisfactorily almost any condition, no matter how exacting it may be. Guying, regardless of the method, must be carefully designed and constructed to fulfill satisfactorily present-day conditions in the telephone field.

COMING CONVENTIONS

Ohio Independent Telephone Association, Deshler-Wallick Hotel, Columbus, April 21 and 22.

California Independent Telephone Association, Hotel Lafayette, Long Beach, April 27.

Kansas Telephone Association, Municipal Auditorium, Junction City, May 5 and 6.

Indiana Telephone Association, Claypool Hotel, Indianapolis, May 11 and 12.

Pennsylvania State Telephone & Traffic Association, Penn-Harris Hotel, Harrisburg, May 20, 21 and 22.

Missouri Telephone Association, Muehlebach Hotel, Kansas City, May 25 and 26.

New York State Telephone Association, Seneca Hotel, Rochester, June 2 and 3.

Washington Independent Telephone Association, Edmonds, June 25 and 26.

The Illinois Telephone Association, Hotel Pere Marquette, Peoria, September 22 and 23.

▼ ▼

Stopping Flood Damage to Exchange

(*Concluded from page 25*)

Portable engine-driven pumps, stored at various points in the state, will be available to clear out any water which might seep through.

Similar measures at the Pearl Street building do not appear practical, because the basement is neither waterproofed nor constructed to withstand the tremendous pressure which would result if all openings were closed.

▼ ▼

California Convention Set for April 27

The California Independent Telephone Association will hold its annual meeting at Hotel Lafayette, Long Beach, April 27, according to a recent announcement by Secretary Ernest Irwin of Long Beach. All telephone companies in the state are urged to send representatives to this meeting.

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IN THE NATION'S CAPITAL

By FRANCIS X. WELCH
Special Washington, D. C., Correspondent for TELEPHONY

POLICIES AND PRACTICES of the A. T. & T. regarding patents brought out in testimony presented last week in FCC Bell investigation. Bell relied on patent protection during its development stage; no longer needs to depend on paper protection and FCC evidently believes Bell should not be so strict regarding use of its patents. The utility issue not likely to be a factor in the President's proposal to reorganize the Supreme Court

THE FOUR days of hearings last week in the FCC special telephone investigation were rather dull for the reason that they had to do entirely with the technical subject of Bell patent practice. For the same reason the hearings were generally shunned by the newspaper reporters, although perhaps the substance of the testimony was among the most important yet developed by the FCC.

George E. Folk, general patent attorney of the A. T. & T. Co., occupied the stand for three days and FCC Engineer E. W. Allen, Jr., introduced a 250-page report giving a history and analysis from the commission's viewpoint of the patent structure of the Bell system.

THE GIST of the Allen report is to the effect that the Bell uses less than half of its 9,234 patents and that over 3,400 of the unused patents were suppressed to forestall competition. Of these suppressed patents, 1,307 were interred because of the lack of "public necessity," while 2,126 were shelved because of "superior alternatives available."

But who determines the "public necessity"? asks the Allen report, which immediately answers its own question by nominating the A. T. & T. as the sole arbiter. This is certainly a broad hint that the FCC thinks it should have something to say about such matters in the future, and it may come to that some day.

The subject of pigeon-holing patents is admittedly a delicate one and, until the Allen report brought up the subject, the Bell has generally given folks the impression that it would rather talk about something else. No telephone man will dispute that there are some instances where patent freezing is not only good business from a selfish standpoint but downright common sense from any standpoint.

Take the hypothetical case of a patent for a small writing pad affixed to the telephone instrument in such a way that it becomes automatically illuminated when the receiver is taken off the hook. (No such silly patent exists as far as this correspondent knows, but other features equally inane have been patented.) Now, here we have a petty improvement that might conceivably take the public fancy, but at what cost?

If Jones installed one, the first time Mrs. Jones entertained the ladies at bridge the telephone company would be annoyed with demands for such a contrivance. Of no essential value itself, it might become a fad. Americans are that way—remember miniature golf and mah jong!

In such an event, the telephone company would either have to retire valuable outstanding equipment long before its useful life expired, at great expense, or tell the folks that they could not have such a gadget unless they paid a prohibitive luxury charge. And this would be at the expense of public relations, not to mention scolding of suspicious regulatory bodies.

THE ONLY way to avoid the problem is for the telephone company to buy up this epoch-marking, era-shaking invention as soon as it appears on the horizon and deposit it in the waste basket. Then everybody's happy—the inventor who got paid, the company that got saved, and the public who never knew what it missed.

Unfortunately, all suppressed patents do not fall into this category of nuisance patents. This is especially true of the patents which the A. T. & T. freezes because of an alleged "superior alternative available." The Allen report stated:

"Now referring to the group of patents that are unused because superior alternatives are available: This is a type of patent shelving or patent suppression which results from excessive patent protection acquired for the purpose of suppressing competition.

"The Bell System has at all times suppressed competition in wire telephone or telegraphy through patents. It has always withheld licenses to competitors in wire telephony and telegraphy under its telephone and telephonic appliance patents, and this exclusion is extended to patents covering any type of construction.

"Moreover, the Bell System has added to its . . . patents any patent that might be of value to its competitors. This policy resulted in the acquisition of a large number of patents covering alternative devices and methods for which the Bell System has no need. . . ."

That is stating the case a bit strongly, perhaps, but it gives one a rough idea of what kind of game the FCC is gunning for—and it isn't petty nuisance patents.

IT IS an interesting fact, brought out by the Allen report, that more than 96 per cent of the total

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patents owned or controlled by the Bell system (9,255) were the product of its own employes. Some of the patents bought from the "outside," however, were very important. Handset and automatic dial improvements by Independent manufacturing concerns were complimented by the report as being superior to the Bell shop product.

A Bell practice of restricting, through its patent agreements, sales opportunities of Independent manufacturers was averred. Special notice was given to the ban against Independents selling or manufacturing any type of automatic telephone exchange apparatus suitable for service in larger cities, comparable in population to those served by the Bell operating subsidiaries.

The restriction in the use of permalloy and use of improvements necessary for effective long-distance service (such as the Pupin loading coil and the Shreve repeater) were also commented upon critically by FCC Assistant Counsel Bauer in the process of examining the Bell patent attorney, Mr. Folk.

THE WHOLE story boils down to the obvious fact that during its development stage, the Bell relied on patent protection, both as armor against competition and also as a method of eliminating economically wasteful duplication. This was in accordance with the Federal patent laws. In fact, that is what a patent law is for—to give exclusive protection to whosoever owns it. "You can call that suppression if you want to," as Mr. Folk frankly stated to Counsel Bauer, nevertheless it was perfectly legal and still is.

Now, however, that the Bell has perfected its national monopoly within its own operating territory —a monopoly admittedly necessary for the rendition of an improved type of service—it needs no longer to depend on paper protection. By the same token, believes the FCC, it is no longer necessary for the Bell to be so tight about its patents, and it is a good hunch that the FCC is already aiming to have a hand in the matter in the future.

WELL, IT SEEMS as if your correspondent was only a bit early in his hints that the friends of the President's Supreme Court reorganization plan were trying to drag in the utility issue. This was mentioned in commenting on the recent utterances of Federal Power Commissioner Frank R. McNinch. The real push on this particular front came when the Utility Consumers National Power Policy Committee opened up shop in Washington at the National Press Building and issued a detailed statement (in the form of a report) laying the "failure" of regulation entirely on the doorstep of the United States Supreme Court.

There is neither necessity nor space to review the report in this department. Most TELEPHONY readers perhaps have either already read it or have a good idea of what was in it. Suffice it to say that the report is generally accredited to John Bauer, New York valuation expert, and it ribs the U. S. Supreme Court for encouraging such phenomena as 10-year rate cases, and the complete re-examination by allegedly unqualified justices of the findings of expert regulatory authorities.

The strategical intent of this group, it must be admitted, is quite smart politically. For has it not been demonstrated time and again in Washington that during recent years the surest way to put something over is to say the utilities are against it?

Pin a power trust label on anything from a rearmament bill to an act to feed the squirrels on the White House lawn, and immediately legions of members spring to your aid. That's all you need to tell them about the iniquitous bill. It will go down in defeat without a doubt.

Unfortunately, the valiant effort of the new anti-utility lobby to drag in the utility issue by the heels is not going to be such an easy job because of the very nature of the Supreme Court reorganization proposals.

THE PRINCIPAL—in fact, the only—objection that the New Deal has to the Supreme Court is its annoying habit of kicking out so-called progressive legislation. However, the court has not used this veto power, particularly in the matter of utility regulation, for the simple reason that regulatory legislation itself has not often been called into question.

The objections to the court raised by the anti-utility lobby go almost entirely to cases which have been decided on an issue of due process—rate cases, in other words, in which statutory legislation has not been involved. The anti-utility lobby tries to get around this by pointing out that "while the court has not *directly* declared these (regulatory) legislative measures unconstitutional, by *indirect* action the majority has nevertheless rendered them practically or largely ineffective."

The distinction, however, is perhaps a bit too subtle for the average layman, who is likely to point out that there is enough argument about the laws which the court has actually killed to waste time bothering with laws which it may have only crippled.

In any event, notwithstanding the activities of the utility critics, it is noticeable that the press, usually very sensitive to anything that reflects upon the public utility industry, refused to rise to the bait. Even the New Deal lieutenants are for the most part not encouraging this sham battle, doubtless feeling that public reaction to red herring may do the President's cause more harm than good.

And so, it is likely that the Supreme Court proposal will be ultimately decided on its own merits without benefit of the ubiquitous power trust issue.

LEST the telephone men feel, however, that this is another instance where the telephone industry must suffer insults because of its mere legal alliance as a member of the general public utility family to the power industry, it may be well, in the interest of humility, for them to look over the names of the five to 11-year old rate cases that are the basis for much of the constant harangue about the failure of commission regulation.

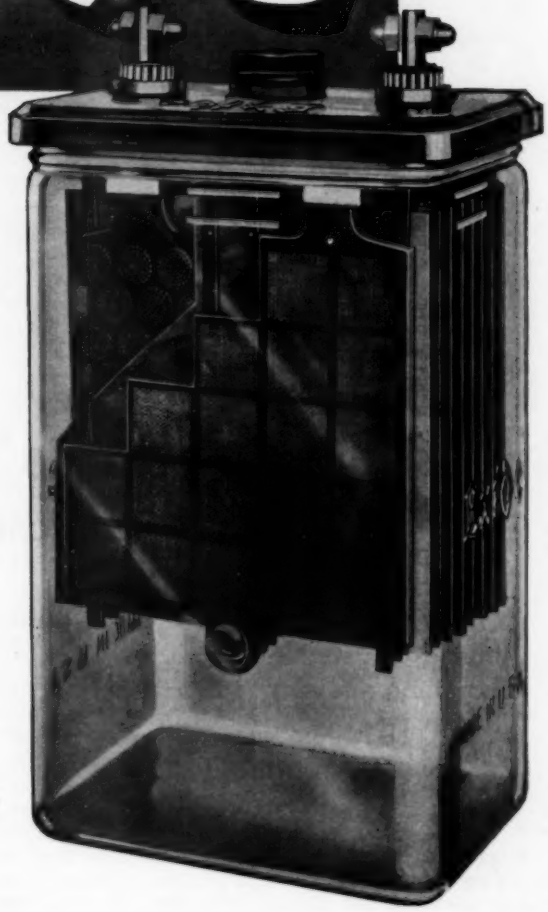
Very few of the real old-timers are power cases. By far, most of them are telephone cases. It might be added that none of them involve Independent telephone companies.

There is another side, however, to the proposition that the Supreme Court should be changed so as to make it easier for a liberal government to regulate private enterprise. The thought was well expressed last week in the testimony before the Senate judiciary committee by Professor William M. Cain of the Notre Dame University, College of Law. He said:

"No man seeking investment for his capital is likely to assume the hazard he would be compelled to assume if interpretations of constitutional guaranties are to vary with variations of public opinion. His failure to invest in industrial enterprises would result in fewer jobs, a drop in purchasing power, lessening demand for manufacturers and corresponding business stagnation."

Speaking of the U. S. Supreme

Exide



The most important value of this battery cannot be measured in dollars and cents.

WHEN everything is going smoothly in your exchange, an Exide Chloride Battery, like any other piece of equipment, carries its full share of the routine job. However, things do not always run smoothly. The unexpected often "upsets the works". A storm may damage electric lines servicing your exchange; or, an accident or short circuit may develop within the building itself. It is these unpredictable and unavoidable events which cause sudden demands for peak battery performance. It is then that the dependability, reserve power and long life of Exide Chloride Batteries stand out above ordinary storage battery equipment.

In such emergencies Exide Chloride Batteries can be depended upon to see you through. Their tremendous reserve power will take care of sudden peak loads far in excess of their normal rated capacity. Furthermore, it makes no difference whether emergency demands are made often, or at widely separated intervals—*Exide Chlorides will deliver the power so urgently required when you need it most.*

Naturally, the value of such dependable performance cannot be measured in dollars and cents; but, the economy which results from the many extra years of service which Chloride Batteries give is a factor that can be figured. No matter what your telephone battery job may be—common battery, emergency reserve, signalling, P.B.X.—it will be done more dependably and economically by an Exide Chloride Telephone Battery.

THE ELECTRIC STORAGE BATTERY COMPANY, Philadelphia

The World's Largest Manufacturers of Storage Batteries for Every Purpose

Exide Batteries of Canada, Limited, Toronto

Court, the remarks on the Ohio Bell case made in this department last week seem to have given some folks the idea that your correspondent thought the Ohio Public Utilities Commission to be a sure winner. What was intended, however, was only a presentation of the issues involved—not a prediction as to the outcome which may very well turn on questions of procedure or evidence.

This is stated in advance of the Supreme Court decision, because one journalist colleague of your correspondent offered to bet that Ohio Bell would be the winner. Of course your correspondent refused on grounds that it is unethical to forecast Supreme Court decisions—and besides he wanted odds.

▼ ▼

CIO Opens Drive to Unionize Bell Employes

The Committee for Industrial Organization began a campaign on April 10 to organize the 270,000 employes of the Bell System, according to newspaper dispatches from New York City early this week.

Weeks of guarded "missionary" work by representatives of the United Electrical and Radio Workers of America in the Western Electric shops and Bell laboratories preceded an announcement by James B. Carey, president of the CIO affiliate, that his union was prepared to charter eight A. T. & T. locals within the next two weeks.

Promotional literature has been distributed among the 4,000 workers in the Bell Telephone Laboratories in New York, Mr. Carey said. He displayed, as typical of this literature, a leaflet charging that the company had capitalized on the depression to cut personnel and wages, at the same time that it was increasing dividends.

What stand would be taken by the A. T. & T. Co., which has total assets valued at $4,200,000,000, could not be determined on April 10. Vice-President Arthur W. Page said the company had no comment to make at present.

Mr. Carey said reports from the union's field organizers were "most encouraging"; that a district system of organization had been set up to facilitate the enrollment of members and that the drive would extend into all sections of the telephone system.

The Operators' Corner

By MRS. MAYME WORKMAN

Traffic Supervisor, The Illinois Telephone Association, Springfield, Ill.

OCCASIONAL conditions encountered in handling collect calls. Series No. 284

A COLLECT call is one for which the charge is to be billed to the called station or party. When a customer places a collect call the operator enters "col" in the collect space on the ticket. She also secures the calling party's name and enters it in the "Person" space.

When a party places a collect call for a particular person it may so happen that the called person, or some other person acting for him, will not accept the charge for a person-to-person call but says that the charge will be accepted for a station-to-station call. In this case the operator will ask, "Will you hold the line, please?" She will make the necessary ticket entries, and if the calling party is holding the line she will ask, "Will you pay for the call?"

If the calling party agrees to pay for the person-to-person call the operator will enter "ag paid" in the space for reports, will draw a line through "col," and say to the called party, "Mr. (calling party) will pay for the call" and will proceed as on a paid call.

If the calling party indicates that he has not heard or understood the report, or if he has not been holding the line, the operator will give the report, saying, for example, "Mr. (called party) will not accept the charge on a person-to-person call but will accept it on a station-to-station call. Will you pay for the call?"

If the calling party agrees to pay for the call, proceed as just outlined, but if he desires the call completed as a station-to-station call, the operator will inform him that the connection will be considered as a new call. If he offers no objection, the operator will cancel the original ticket bearing the report charge, "charge not accepted (time)," and will write a new station-to-station collect ticket, and will complete the connection.

This is in answer to question No. 1 in this week's questions.

In some cases the called station or party, in addition to refusing the charge, indicates that he does not wish to talk to the calling party at that time or later. Under this condition, the operator will say, "Thank you," and will clear the circuit. Then if the calling party is holding the line and he does not cancel the call, the operator will say, for example: "They will not accept the charge and do not wish to talk."

If the calling party states that he will pay for the call or asks the operator to make a later attempt, she will connect him with the person locally designated to handle such cases.

Questions from Illinois Operators

1. A party places a person-to-person collect call from Chicago to New York. The called party says he will accept the charge only if the call is station-to-station. What should you do?
2. When a party from a paystation refuses to pay a report charge or doesn't want a report, what is the procedure?
3. On reaching called place, should one say, ordering number, "Toll 10" or "Ld 10"?
4. On calls to ringdown tributaries, should "rd" follow the name of the station on the ticket?
5. Is a new ticket required when there is no one at the called number to OK a station-to-station collect call and you are asked to try the call again the next day?

The answers to these traffic questions are given on page 48.

▼ ▼

Fight for Illinois Bell Refund Residue

Rivalry between the city of Chicago and the state of Illinois over $2,000,000 of unclaimed Illinois Bell Telephone Co. refunds in Chicago developed April 7 when it was learned that a bill pending in the legislature would give the fund to the state.

The money is part of $20,000,000 that the company was ordered by the United States Supreme Court to refund as overcharges on certain types of coin-box service over a number of years. Persons entitled to the residue have not been located.

Mayor Kelly of Chicago declared the legislative bill to be unfair, pointing out that all the money involved was paid to the company by Chicagoans and reasoning that the city should receive it.

The mayor also pointed out that the city financed ten years of litigation to obtain the refunds.

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OUTSIDE PLANT ENGINEER:
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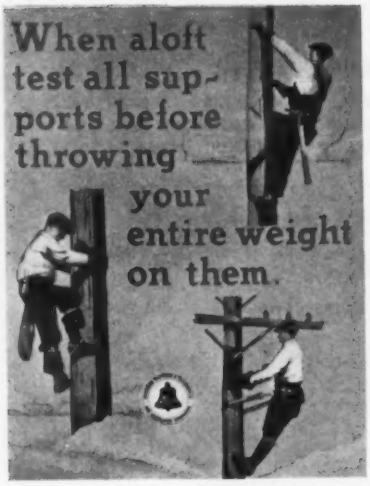
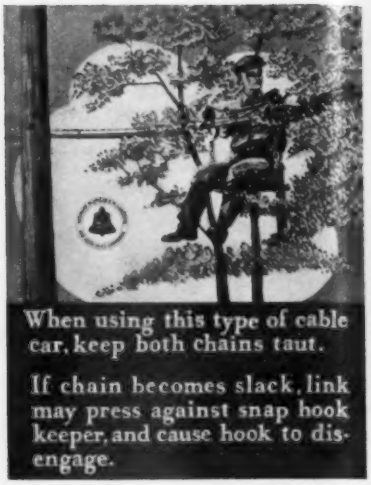
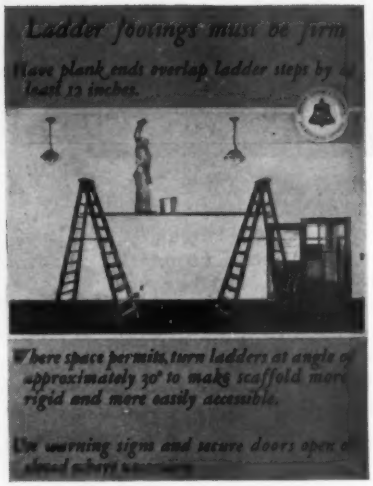
Some Safety Hints for Plant Men

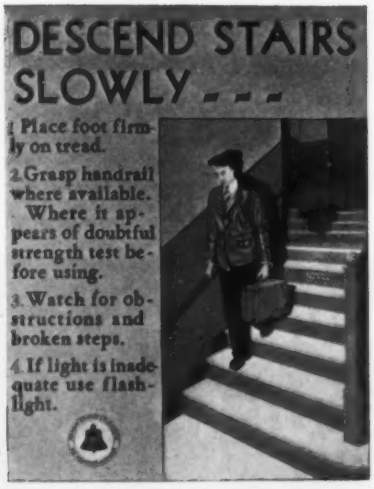


To avoid strains in Lifting...
Secure firm footing with feet slightly separated.
Bend knees.
Keep back as straight and nearly vertical as possible.
Take a firm grip on object.
Straighten legs slowly.
Call for assistance whenever you have any doubt as to your ability to lift object safely.


When using this type of cable car, keep both chains taut.
If chain becomes slack, link may press against snap hook keeper, and cause hook to disengage.

Strand puller should be pulled in approximately a straight line with strand.
Watch for Slippage!
Grease or galvanizing in strand puller jaws may cause them to slip.
If slippage is 1/2inch or more, ease off, clean strand puller and start again.
Wipe out grease.
Clean out galvanizing with blade of screw driver.


Ladder footings must be firm
Have plank ends overlap ladder steps by at least 12 inches.
Where space permits, turn ladders at angle of approximately 30° to make scaffold more rigid and more easily accessible.
Use warning signs and secure doors open or closed where necessary.


DESCEND STAIRS SLOWLY . . .
1. Place foot firmly on tread.
2. Grasp handrail where available. Where it appears of doubtful strength test before using.
3. Watch for obstructions and broken steps.
4. If light is inadequate use flashlight.

Keep Snap Hook on Safety Strap clear of Strand, Wire, Crossarm Brace, etc.
OTHERWISE
as you lean forward, pressure may depress keeper and safety strap may disengage when you again throw your weight on it.

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United States Steel Products Company, New York, *Export Distributors*

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Rainier crossarms and braces are essential parts of a well constructed pole line . . . the trouble free kind of pole line that represents the wisest investment any telephone company can make.

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AMERICAN CROSSARM & CONDUIT CO.
Chicago

Plant Men Talk Things Over

The Uneventful Life of a Trouble-Shooter

By Doc

I later worked on another switchboard trouble job which would not compare favorably with a political position. The toll section was of the low key-shelf type of ancient vintage and had been constructed locally from parts of all description. This toll board was terrible to maintain as the circuits had been changed frequently over a period of years and the drawings not kept up-to-date. Needless to say though, I gained some valuable circuit experience on this job, for everything had to be tested in detail to trace the circuits.

The local and rural part of the switchboard of ten positions, was quite modern for that period, although excessively overloaded. This board was of the mechanical signal type without line or cut-off relays. The line signal consisted of a large bulls-eye about 1½ inch in diameter, which when operated closed a contact that controlled the auxiliary circuits. This switchboard worked very well although the signals stuck frequently and were difficult to repair.

The same type signal was used for supervision. They were mounted in two rows, directly beneath the line signals. The multiple jacks were situated below the supervisory signals and the piling rail. No answering jacks were provided and each operator just answered all the signals she could see from her position.

The chief operator's desk was also an old-timer and our chief operator surely used it with a vengeance. She monitored the positions constantly and the girl she found doing anything not strictly in the line of duty was indeed unfortunate. Just the other day I learned that one large telephone company had recently removed all its chief operators' desks and the chief operator now occupies a position on the switchboard. When she is not busy on something special—such as ironing out a traffic complaint or reporting trouble—she can answer a few calls. Things change constantly and this may be a practice worth considering, although it seems peculiar to some of us old fogies.

The local switchboard in this exchange had some peculiarity in that the operator, say on the 10th position, could open a key and place the tip of a calling cord on a metal part and talk to any other operator who made the same set-up. It is one of the unsolved mysteries how operators discover all the "phony" things they do around any switchboard.

An Operating Room in the Old Days Where Maintaining the Ancient Type Toll Board Was a Real Problem.

Back in the old days cords caused us considerable trouble and seldom did a day pass that it was not necessary to replace several worn or defective cords on each of the busy positions. It must also be considered that we were not proficient in the rebutting of cords then, for we were passing through that stage when we thought we should resolder the metal tips on the tinsel conductors. We were also trying to make a hitch

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POWERFUL
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Operates on 110 volts A.C.

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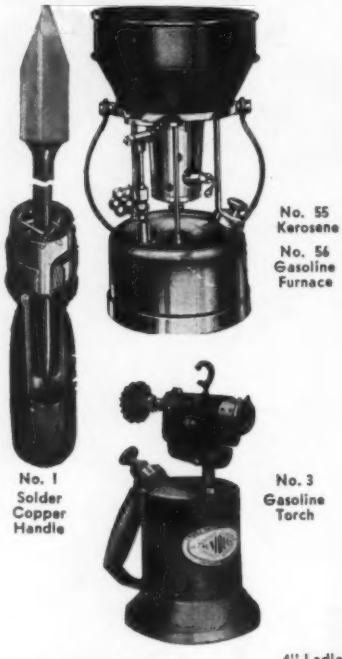

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(Formerly Whiting St.)

of No. 28 bare tinned copper to the tinsel conductor and then bind this wire under the terminal screw.

At that time we had not thought of the simple way of piercing the tinsel and placing the terminal screw through it. The modern switchboard cord is, indeed, a marvel, and it is difficult to understand how they can stand so much hard usage and abuse and not cause trouble. Present-day manufacturers also consider the maintenance man, for the new cords are likewise easy to rebutt.

I do not doubt that the old toll switchboard, which used to cause me so many headaches, is still in service and some of these days, if I get time, I am going back to see.

▼ ▼

How to Avoid Kinks in Messenger Strand

Every user of wire rope or cable messenger wire, who has had trouble with kinks in such wire strand, will find the accompanying illustrations of value. They also show prospective user what to guard against. To obtain maximum service from a wire rope, careful attention should always be given to methods of handling as indicated in the drawings presented through courtesy of the Columbia Steel Co., subsidiary of the United States Steel Corp.

Fig. 1-A shows how wire rope or messenger strand should not be uncoiled, and how it should be uncoiled. Fig. 1-B shows the wrong way and the right way of unreeling strand from reels. Fig. 2 shows how a kink starts, how the wire kinks, and how it looks after it is straightened out.

When the kink in a wire rope is straightened, the wires may or may not be broken—but the damage is done. The rope has been weakened, and when put to work the wires will soon break. Never use a wire rope that has been kinked, unless the kinked portion is completely cut out.

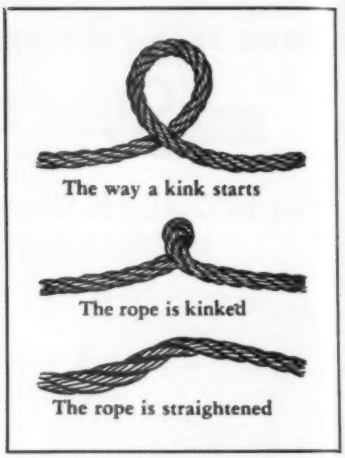

Fig. 2. Kinking of Messenger Wire and Damage When Straightened.

▼ ▼

Some Safety Hints When Trimming Trees

Outside plant men should use safety precautions when trimming trees and cutting undergrowth as well as other duties connected with this work. Use a safety sling when trimming trees and be sure to keep yourself up above the limb you are cutting in order to keep the limb from kicking back, mashing you and perhaps causing an injury. Saw the limb a little on the under side and finish it from the top side. Doing this will keep the limb from splitting off. Cut off limbs at the joints or, we may say, where another limb has grown out. By doing this the cut will grow over and

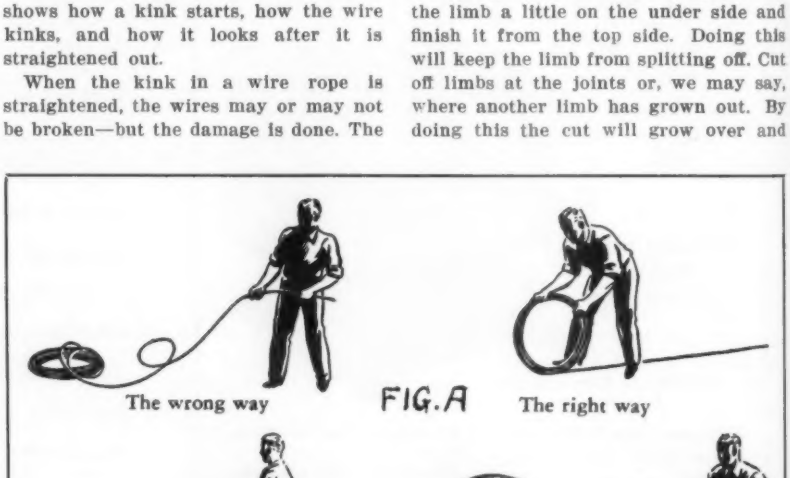

Fig. 1. Wrong and Right Ways of Handling Messenger Wire or Strand in Coils or on Reels.

keep the limb from rotting. Paint them where they are cut off.

Avoid spurs when climbing trees if you can possibly do so. Do not carry an axe or hatchet up a tree to do trimming; use a coarse tooth saw. Rope all heavy limbs to keep them from swinging around, possibly causing an injury to some one.

When trimming trees always be on the lookout for power wires and electric light wires, as well as poison ivy and poison sumac. In case you come in contact with these plants, wash your hands immediately with laundry soap. A cake of laundry soap should be kept in your first-aid kit at all times for such an emergency.

Be careful to avoid climbing on dead branches for there is great danger of their cracking under your weight, causing injury or perhaps death.

When it is necessary to cut a tree in close quarters, be sure to rope it to fall in the proper direction. When letting limbs down or roping trees to be cut, use the hitch in your rope called the timber hitch—avoid the granny and farm knots. Safety-first rests with you; be careful.

SUMTER, S. C. B. E. HARDIN.

▼ ▼

Cable Repairman's Work Attracts Bee

A cable repairman of the Southwestern Bell Telephone Co. was making some spot weld repairs in Fort Worth, Texas, recently, when he became conscious of a buzzing sound. He looked up and was a bit disconcerted to find a bee buzzing around his head.

As a cable buggy is not a very good place to be when bees are around, the repairman decided that his best course lay in pacifism. So he continued his welding, apparently paying no attention to the bee. Soon he noticed that the bee was attracted to the smoke curling up from the rosin core solder.

Just what the attraction was to the bee, or just what reminiscences the odor brought to its mind, could not be decided, but the friendship blossomed into a beautiful thing, according to a writer in the Southwestern Telephone News. At times the repairman had to brush the little bee out of the way to keep him from getting burned. The bee stayed with the cableman all afternoon, following him from span to span.

▼ ▼

Washington Convention at Edmonds June 25-26

The annual convention of the Washington Independent Telephone Association wil be held at Edmonds June 25 and 26, according to a recent announcement by J. W. Baker, of Spokane, secretary-treasurer.

WB

Telephone Wire

(Most Economical of All)

For 39 years the Whitney Blake Company has produced "LONG LIFE" telephone drop wire. By consistent research and new methods of manufacture and test the most economical drop wire that it is possible to produce is constantly made available to the telephone field. "WB" insulation is available with any conductor . . . copperweld, bronze or copper. Other wires offered are inside—bridle—duct—distributing frame and switchboard wire.

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CABLE TESTING
(NITROGEN METHOD)

•

OXYACETYLENE WELDING AND CUTTING

•

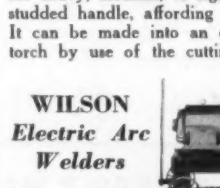
ELECTRIC ARC WELDING

Dry Nitrogen

A simple, safe, inexpensive means of keeping underground and aerial telephone cables under pressure, of testing cable leads, and of quickly locating leaks which may develop in service.

Gas Pressure REGULATORS

Airco - DB Two - Stage Reduction Regulators automatically maintain set delivery pressures from start to finish, and function perfectly even when coated with ice.



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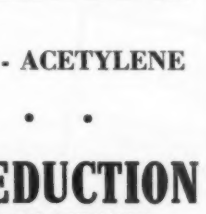
Welding and Cutting Torch

A general purpose torch for heavy, medium, or light work, with a studded handle, affording a positive grip. It can be made into an effective cutting torch by use of the cutting attachment.

WILSON
Electric Arc Welders



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Commission and Court Activities

FCC Bell Probe Takes Up Patents

When the hearing in the investigation of the Bell by the FCC was resumed on April 5 the matter of Bell patents was taken up. The hearing occupied four days and was adjourned April 8 subject to call. It is expected that it will not be resumed until sometime in May.

George E. Folk, patent attorney of the A. T. & T. Co., was a witness for three days. The commission's testimony was presented by E. W. Allen, Jr., and was based on a report of 250 pages giving the Bell's patent structure and its history, practices and policies. Examination of the witnesses was conducted by William H. Bauer, counsel of the FCC.

Mr. Bauer, in his examination of Mr. Folk, endeavored to show that the Bell through a patent monopoly attempted to eliminate competition and in later years, through retaining for its exclusive use loading coils, repeaters and vacuum tubes, to keep a monopoly in long distance service.

It was also indicated by Mr. Bauer that the A. T. & T. had forced the associated Bell companies, through patent restrictions and licensing of its inventions, to purchase their equipment from the Western Electric Co., thus maintaining the prices of the latter without any competitive comparison.

The report presented by Mr. Allen alleged that 3,433 patents out of 9,234 at the end of 1934 had been suppressed as coming under the classification of "no public necessity" or "superior alternatives available." It was shown, however, that 96.5 per cent of the patents were invented by Bell employes.

In his testimony, Mr. Folk, patent attorney of the A. T. & T., pointed out that the federal law on patents gave the company exclusive use of inventions for the period of the patents' life. He emphasized the aim of the A. T. & T. to produce the most efficient equipment so as to provide the public with the best service at the lowest cost. From time to time, he stated, the Bell company had made its inventions available to others and he declared that the patents had been used legitimately and with no effort to suppress competition.

In his testimony, Mr. Allen discussed inventions by the Independents and referred to the handsets, stating that "since the Independent telephone handsets are designed for the same types of circuits as are those of the Bell System, there is nothing to prevent sets of different makes from working in harmony within the same system. . . .

"From a patent standpoint, there is no reason why a Bell System associated operating company could not entertain bids for transmitter and receiver units having specified operating characteristics and of such dimensions as to fit Western Electric handsets."

Mr. Allen's report covered the early telephone patents and showed the various practices of the Bell in connection with the use of the various inventions. It also detailed the purchasing and licensing of patents from various Independent manufacturers.

▼ ▼

Refunds Completed; Rate Case Closed

The Ohio Public Utilities Commission issued an order April 4 closing the case known as A.U.R.P. No. 194, after the Ohio Associated Telephone Co., as successor to the Marion County Telephone Co., submitted a decree of the United States District Court.

The decree disclosed that the company has completed the refunds ordered by that court in its disposition of the appeal from the commission's order of September 26 and October 18, 1930, reducing rates for service at Marion and ordering refunds of the excess collections, including the payment in 1935 of the unclaimed sum of $3,397.79 to the treasurer of the city of Marion and of $64.74 to the treasurer of Marion county.

▼ ▼

New Pennsylvania Commission Confirmed

The new Pennsylvania Public Utility Commission, appointed by Governor Earle, was approved by the state senate on April 5. The personnel of the commission is as follows:

Chairman, Dennis J. Driscoll, Elk County, former Congressman, appointed for a ten-year term; Thomas J. Buchanan, Beaver county, former member of the old commission, appointed for an eight-year term; Richard J. Beamish, Dauphin county, former counsel of the old commission, appointed for a six-year term; Guy K. Bard, Lancaster county, former United States district attorney, eastern district, appointed for a four-year term; and Donald M. Livingston, Delaware county, appointed for a two-year term.

The number of commissioners of the new regulatory body is reduced from

seven to five, but the salaries remain the same—$10,500 for the chairman and $10,000 for commissioners.

Chairman Driscoll's outline of the policy of the new commission was most gratifying to telephone men. He stated that it would be the commission's duty to protect the interests of the public, the utilities and the stockholders, with fairness to all to the end that each might reap the rewards of good service, at a fair rate and a reasonable return on capital invested.

▼ ▼

"Non-Political" Ballot Defeated in Nebraska

The Nebraska legislature defeated on third reading a bill that included the members of the Nebraska State Railway Commission with other officers to be elected on a non-partisan or non-political ballot. Another measure submitted a constitutional amendment which excludes the commissioners from the list of elective political officers.

▼ ▼

Ohio Commission Reports On Reduced Rates

The Ohio Public Utilities Commission issued a statement April 7 showing that during January, February and March reduced rate schedules filed with that body by public utilities will mean a saving to the people of Ohio of $2,211,969.72 per annum.

The largest item in this total is $1,912,000 in reduced telephone rates. Savings in electricity rates including domestic, commercial and industrial service will amount to $276,060.29 and in gas rates $23,909.43.

▼ ▼

Trial of Wisconsin Bell Rate Cases

Trial of appeals of the Wisconsin Telephone Co. from three Wisconsin Public Service Commission orders was resumed on April 5 before Circuit Judge August C. Hoppmann in Madison.

The testimony and cross-examination of Cyrus G. Hill, who headed the engineering phases of the Wisconsin commission's investigation of the Bell rates and now chief engineer of the FCC special staff for the Bell investigation, was completed on April 7. Judge Hoppmann on that date overruled a motion of the Wisconsin company to strike out of the record all the testimony Mr. Hill had given on price comparison of Western Electric and Independent telephone equipment manufacturers.

On April 8 officials of the Bell System commented rebuttal testimony on Mr. Hill's contention that prices of Independent telephone suppliers are lower than those of Western Electric.

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- ☐ **Braiding**—Runzel makes a tight braid of best materials that wears more years.
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Runzel Cords Always Give You the Maximum Service for Your Money

See the Suttle Salesman Catalog for Complete Prices on Runzel Cords.

Plugs ordered with switchboard cords attached without extra charge.

Runzel Moistureproof Cords are used on all Suttle Telephones—just an added first quality feature to first quality instruments. New Suttle CRYSTOPAC at right.

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Immediate Shipment from Lawrenceville, Illinois

Edward V. Cox, assistant vice-president of the A. T. & T., in charge of equipment pricing, John B. Rees, equipment engineer, and Frank J. Hammell, chief of appraisal, Western Electric Co., all of New York, were witnesses. They maintained that prices of the Western Electric actually are lower than those of Independent telephone suppliers.

To permit Harold M. Wilkie, special counsel for the Wisconsin Public Service Commission, time to prepare for cross-examination of these witnesses of the Bell, the trial was adjourned until April 26. At that time Mr. Wilkie, assisted by D. A. Myse, will commence the cross-examination.

Examining Physician Ruled Independent Contractor

The appellate division of the New York Supreme Court early this year ruled in the case of Schneider vs. New York Telephone Co., that the defendant is not liable on the doctrine of respondent superior for alleged malpractice of the physician employed by it in connection with its disability plan to make examinations of all employes, there being no evidence of negligence in his selection and his ability and competency being conceded. The physician, in this instance, was held to be an independent contractor.

This action was brought to recover for injuries suffered by the plaintiff due to the alleged malpractice of the defendant, Dr. Rizzo, one of the physicians employed by the New York Telephone Co. in conducting optional examinations of its employes in connection with its employes' benefit plan under the state compensation laws. He also spends a portion of his time in private practice.

Excerpts from the court's opinion follow:

"The plaintiff was an employe of the New York Telephone Co. and consulted the defendant Dr. Rizzo at the direction of her supervisor. She had injured her foot while sketching in Bronx Park about two months prior to her first consultation, and, unknown to her, osteomyelitis had developed.

The malpractice charged was that the doctor ordered an X-ray of the plaintiff's ankle when the swelling and inflammation were in the instep. A further charge of malpractice was based on the doctor's subsequent advice that there was nothing the matter with plaintiff's foot and that she might continue to stand on it while working.

The defendant New York Telephone Co. was held liable (by the lower court) for malpractice on the theory that the doctor was the servant of the company for whose negligence it was responsible. The doctrine of respond superior has no application to the situation shown by this record. A doctor employed under these conditions is not a servant of his employer but is engaged in an independent calling and his status is that of an independent contractor. The courts of this state have uniformly so held. . . . .

The evidence against the defendant Dr. Rizzo shows, without contradiction, that plaintiff at the time she first saw this defendant had a diseased condition of the bones of her foot which had existed for at least two months and which grew progressively worse thereafter. The only damage for which the doctor could be held responsible was for an aggravation of the existing condition resulting from his failure to treat the plaintiff properly.

This issue was not presented to the jury by the court. The only issue which was presented was whether the alleged malpractice of the doctor was responsible for the entire condition which developed. The finding in the plain-

Answers to Traffic Questions on Page 38

1. Please refer to preface.
2. On a person-to-person call, if the calling party states that he does not wish a report, or says, for example, "Don't call me until you have my party," and the call originates at a paystation, tell him that the request cannot be granted, as a report may be received for which it will be necessary to collect a report charge. If he refuses to pay a report charge, connect him with your supervisor. She will attempt to secure the deposit. If she is unable to do so, she will refer the call to the person locally designated to handle such a case.
3. "Ld 10" is correct.
4. Enter "rd" in the called "Place" space following the name of the called station.
5. If there is no one there to accept the charge and the calling party asks you to try the call again the next day as a station-to-station call, it will be considered as a new call.

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PITTSBURGH, PA.

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tiff's favor on this issue is against the clear weight of the evidence.

The judgment and orders should be reversed, with costs to the defendant New York Telephone Co., and the complaint dismissed with costs to said defendant, the action severed and a new trial ordered as to the defendant Peter Rizzo, with costs to said defendant to abide the event."

▼ ▼

Missouri Supreme Court On Depreciation Reserve

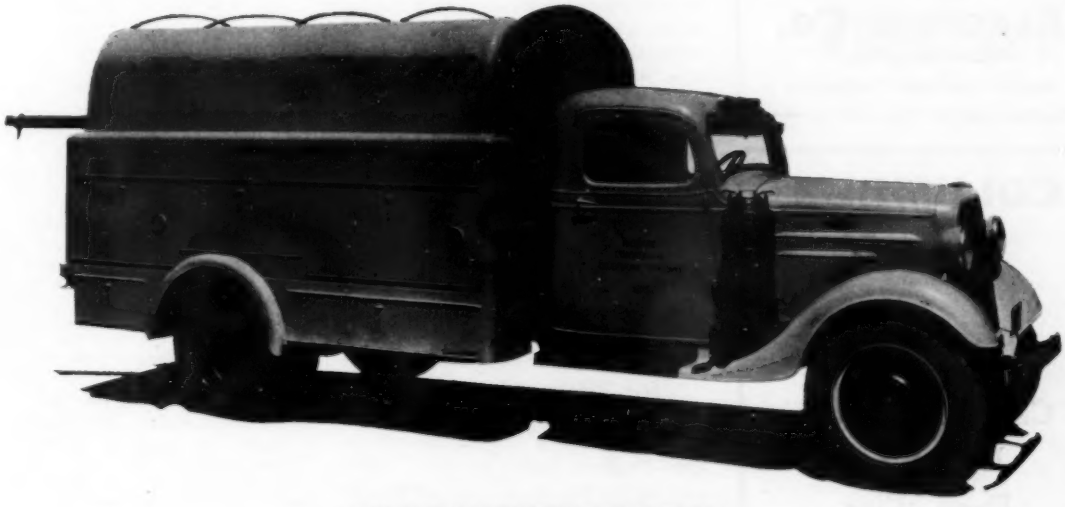
The Missouri Supreme Court, in a recent ruling, reversed the judgment of the Cole county circuit court, sustaining the public service commission in the case of the state of Missouri ex rel. Empire District Electric Co. vs. Public Service Commission of Missouri. It held that the commission was without power to require the electric company to replace in its depreciation reserve fund sums of money which the company, over a period of years, had transferred from that fund to surplus. At no time had the commission made any order requiring the company to set up or carry a depreciation reserve fund, as it was empowered to do under the Missouri statutes.

The court held that while the statute authorized the commission to require the company to carry a depreciation reserve fund in an amount fixed by and subject to regulatory control of the commission, no power is given to make retroactive orders in respect to such fund.

Aside from the want of statutory authority, the order of the commission was held wrong in principle since the fund belongs to the company and is subject only to being used to guarantee that its property will be kept in proper condition for efficient service.

The cause was instituted by the commission on its own motion to determine the fair value of the property of the Empire District Electric Co., a Kansas corporation. At hearings in the matter it was shown that in 1915 the company voluntarily began setting aside a depreciation reserve. In 1923 the directors authorized the transfer of $400,000 from that fund to surplus, leaving in the depreciation reserve some $864,000. In 1926 another sum of $400,000 was so transferred, leaving a reserve of $1,760,000. Again in 1929 the sum of $800,000 was transferred, leaving a reserve of $1,226,000. The $800,000 last transferred to surplus was used in the payment of dividends to stockholders.

POWERS *ALL-STEEL*
TELEPHONE UTILITY BODIES



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UTILITY BODIES . . . CREW CABS . . . WINCHES . . . DERRICKS . . . CAPSTANS . . POWER TAKEOFFS CRANES . . . SUPPORT JACKS . . . SHEAVE BLOCKS. . . WATER CASKS . . . WIRE REELS . . . PINTLE HOOKS . . . OVERDRIVE AND UNDERDRIVE TRANSMISSIONS . . . ACCESSORIES

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The Complete Handset in One Unit

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Modern
Perfect Articulation
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Hardware
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BUCKEYE TELEPHONE AND SUPPLY CO.
COLUMBUS, OHIO

Excerpts from the opinion of the Missouri Supreme Court follow:

"A depreciation reserve whether accumulated voluntarily or pursuant to an order of the commission," said the court, "comes from revenues which the customers pay for service and for that reason it belongs to the company.

"The only purpose of a depreciation reserve, so far as the public is concerned, is to guarantee that the company's property will be kept in proper condition so that efficient service may be rendered. When that purpose is accomplished, the balance remaining in the depreciation reserve belongs to the company, and the company cannot be forced to give it up for the benefit of future customers. . . .

In the instant case it was the duty of the company to adequately maintain its property so that efficient service might be rendered to its customers. Evidently the amounts transferred from the depreciation reserve were not needed for that purpose. We say this because on the record before us we must assume that the company properly maintained its property and rendered efficient service, because there was no showing to the contrary, and no complaint made as to the condition of the property or the character of service rendered during the time in question.

In this situation any amount remaining in the depreciation reserve belongs to the company. The company cannot be forced to leave its own funds in the depreciation reserve for the benefit of future customers, who are themselves supposed to pay a rate for service sufficient to cover depreciation, cost of operation and a fair return to the company during the time they are served."

Expenditures Approved for Utility Inquiry Fund

Governor Holt of West Virginia recently approved a bill authorizing the West Virginia Public Service Commission to utilize $98,814 of unexpended balances to continue rate investigations. The investigations include those of the Chesapeake & Potomac Telephone Co. and the Monongahela West Penn Public Service Co.

Commission Rulings and Schedule of Hearings

Federal Communications Commission Washington, D. C.

April 2: Telephone wire certificates filed by the Southern Bell Telephone & Telegraph Co. requesting authority to supplement existing facilities between Lumberton, N. C., and McColl, S. C., and between Darlington and Robins Neck, S C.; also to supplement existing facilities between Attapulgus, Ga, and Havana, Fla.

Illinois Commerce Commission

April 12: Hearing in Chicago on commission's citation against the Illinois Bell Telephone Co. to show cause why there should not be a reduction in rates for intrastate telephone service rendered by the company in the state of Illinois. Entry of appearance filed by Chicago and villages of Maywood, Olympia Fields, and Richton Park. Protest filed by city of Cairo. Consolidated with following case:

Proposed change in rates Illinois Bell Telephone Co. for telephone service stated in I. C. C. No. 1 section 1 original sheet No. 5 general local exchange tariff, telephone service I. C. C. No. 2 original sheet No. 1A, schedule of toll rates I. C. C. No. 2 original sheet No. 1A, rates for special contract service and I. C. C. No. 2 section 1 original sheet No. 6 teletypewriter exchange service tariff. Protest filed by city of Cairo.

April 14: Hearing in Chicago on application of the Illinois Bell Telephone Co. for consent to and approval of lease to Silver Mirror Co., not a public utility, of certain real estate situated at 211-219 W. Randolph St., Chicago.

Michigan Public Utilities Commission

March 17: Approval granted purchase of the East Allen Telephone Co. by the Allen Mutual Telephone Co.

March 18: Approval granted purchase of certain facilities of the Caldwell Telephone Co. by Lake City Telephone Co.

Minnesota Railroad & Warehouse Commission

April 7: Authority granted application of the Hammond Telephone Exchange for authority to change its schedule of rates at Hammond.

Nebraska State Railway Commission

April 8: In the matter of the application of the Spalding Telephone Co. for authority to continue in effect until April 1, 1938, present emergency rate schedule; found reasonable and granted as asked.

April 10: Formal complaint filed by Lee Wells, Omaha attorney, against the Northwestern Bell Telephone Co., alleging that no report charge is assessable against patrons, under rules on file, where a guest or other unauthorized person answers but has no authority to approve the charge; asks order that company be directed to resist from making a report charge in such cases.

New York Public Service Commission

April 14: Hearing in Albany before Commissioner Lunn in the matter of the proceeding on motion of the commission as to accounts and records of the Tri-State Associated Telephone Corp.

Ohio Public Utilities Commission

April 8: Upon showing that the 61 subscribers involved had applied for Bell rural line service, Ohio Standard Telephone Co. authorized to discontinue the 61 service stations in the Lisbon exchange which the Ohio Bell Telephone Co. has been operating for the Ohio Standard company.

Oklahoma Corporation Commission

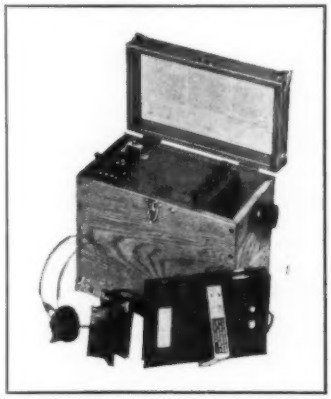
April 22: General hearing in Oklahoma City "for the purpose of investigating the applicability of all present orders, rules and regulations of the corporation commission now in force and effect and for the purpose of adopting additional orders, rules and regulations, touching or in any wise affecting standards of construction of all electric telegraph and telephone wires and lines, looking especially to the elimination of interference by induction or otherwise."

The Manufacturers' Department

Instrument for Locating Buried Cables

Whenever cables have been buried directly in the ground, telephone companies are obliged to find these cables when trouble arises. For this job Stewart Bros., Ottawa, Ill., have designed a "cable locator and cable tester" combined in one instrument.

It is claimed that with this new instrument, any telephone man can locate



Cable Locater and Tester Designed By Stewart Bros.

exactly where the cable is buried and just how deep it is in the ground. In addition, it is said that this set is a complete cable tester whch will locate all cable faults that can be found by the exploring coil method, such as short-circuits, crosses, grounds and wet spots.

▼ ▼

Folder on Killefer Machine for Burying Rural Wire

The Killefer Mfg. Co., of Los Angeles, Calif., has issued a folder describing and illustrating the Killefer No. 201-D wire-laying machine which is attracting the interest and attention of telephone men in various sections of the country. This machine was designed for placing specially-insulated wire underground for providing telephone service in rural districts.

It is equipped with a power lift device. The lifting or lowering of the wire in the ground is controlled from the tractor or truck. The depth at which the wire is to be buried is adjusted, as desired, by means of a crank. Some of the data and photographs used in TELEPHONY of September 26, 1936, are reproduced in this folder.

The Killefer machine has been exhibited at recent conventions in Texas, Oklahoma and Iowa, as well as the convention of the Wisconsin State Telephone Association, held this week in Madison.

▼ ▼

"Footometer" for Pole Line Measuring

Connected to the speedometer mechanism of an automobile a new San Francisco invention is valuable to telephone companies in accurately measuring in feet the length of any proposed or completed telephone line, excavation, or similar project.

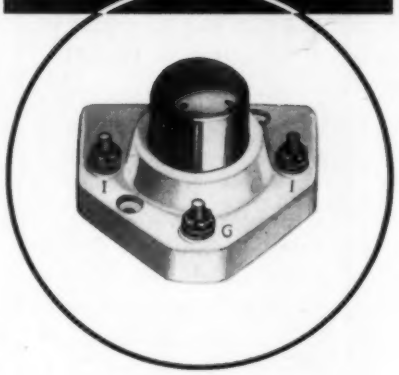
The survey "footometer" has been designed to assist telephone companies, excavating contractors, road maintenance engineers, gas companies, public utility companies, forest rangers, county surveyors, oil companies, Federal Land Bank appraisers, etc., in measuring distances accurately with speed, safety and convenience.

The complete equipment consists of an extension cable, a two-way adapter affording a dual drive from the transmission, a drive cable, a steering post bracket and the "footometer." It can be installed easily on any car or truck and does not interfere with present speedometer equipment. It is equipped with a calculating device, a declutching mechanism, an instantaneous odometer reset button. It is said to calculate accurately to the nearest foot and is also convertible to other units of measure, as rods, meters, etc.

The odometer, which is similar to the mileage counter in a speedometer, can be set to zero instantly by merely pressing inward on a button. A complete revolution of the pointer around the dial indicates the measurement of 100 feet, the odometer tallying the number of hundred feet measured. The capacity of the instrument is 100,000 feet. At this point it is set to zero automatically. When operating the "footometer," it is not necessary to bring the car to a stop, unless considered advisable for greater accuracy.

The footometer equipment can be transferred, if desired, to another car. To do this, it is sometimes necessary to change the fitting on the extension cable, and the gear ratio in the two-way adapter. This change can be made at

SANDS



TYPE 16
SUB-STATION
ARRESTER

A compact, inexpensive sub-station arrester providing adequate protection where crosses with electric circuits are not likely to occur. Consists of two Type 2105 discharge blocks mounted in a heavy porcelain base and covered with a brass cap. Ask for more detailed information on this and other Sands protection equipment.

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Is Made by:

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Entirely NEW in Telephony!

VINCENT
RARE GAS RELAY

Improves Ringing and Transmission on Party Lines Used with Either Coded or Harmonic Bells. Low Cost. Installed with a Single Screw.

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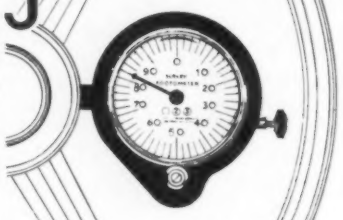
The Survey Footometer



Ideal for measuring distances quickly and conveniently - - easily installed on any car - - has a built-in clutch, an instantaneous odometer reset, and calculates accurately in terms of feet or other units of length.

Price $35.00 Net

When ordering, please give Year, Make, and Model of car. Circular mailed on request

SPEEDOMETER SERVICE CO.

131 FELL STREET
San Francisco, Calif.

any speedometer service station, and no change in instrument is required.

The device is distributed by Speedometer Service Co. of San Francisco.

▼ ▼

Western Electric Has Best Year Since 1931

Sales of the Western Electric Co. during 1936 totalled $146,421,000, an increase of 38.9 per cent over the preceding year, according to its annual report made by President Edgar S. Bloom. Earnings during the past year, including income from subsidiary and associated companies, were $18,698,049, a return of 7.7 per cent upon the investment, as compared with a return of 1.9 per cent in 1935 and substantial losses in the two preceding years.

For the nine-year period, from 1927 to 1935 inclusive, Western Electric sales were as follows: 1927, $253,724,000; 1928, $287,931,000; 1929, $410,950,000; 1930, $361,478,000; 1931, $228,956,000; 1932, $117,850,000; 1933, $69,511,000; 1934, $91,807,000; 1935, $105,417,000.

At the close of 1936 the plants of the Western Electric Co. were operated at 53 per cent of capacity, with 34,004 persons employed on a five-day, 40-hour week. At the beginning of the year only 27 per cent of plant capacity was used, with a staff of 21,033 employes. The annual going rate of the payroll rose from $44,365,000 at the beginning of the year to $61,511,000 at its close, an increase of 38 per cent.

Dividend payments discontinued in 1931 by the Western Electric Co. were resumed in 1936, with payments aggregating $2.75 a share. The surplus as of December 31, 1936, amounted to $15,130,951, an increase of $1,389,417 over the previous year.

The position of the company as manufacturing and supply agent for the Bell System was emphasized by President Bloom. He declared that, "with the improvement in business, important reductions in prices charged the telephone companies have been made effective.

"This action is in keeping with the company's established policy of selling to Bell telephone companies at the lowest prices consistent with payment of fair wages to employes and a reasonable return on investment."

Total assets at the year end were $283,231,912 and included current assets of $89,247,749, against current liabilities of $17,907,051.

▼ ▼

Metered Service Results in Small Exchange

Metered service is being successfully used in a small exchange by W. H. Griffin of the Valley Mills (Texas) Telephone Exchange. Mr. Griffin, who operates approximately 140 stations from his office, has perfected a meter and tested it out in his plant, and here is what he says it has done for him:

"I give a customer what he pays for. I get pay for service rendered. I cut out all dead-head talk (this is valuable). I have increased my income from 10 to 20 per cent. I have increased by subscribers from 20 to 30 per cent. I often have a meter customer to change to the flat rate."

Mr. Griffin puts two or more persons —who for various reasons do not want a flat rate telephone—on one line. He charges one-half the flat rate as a minimum; if one person is on the line the charge is three-fourths the flat rate. He allows 30 calls and a few calls extra to recompense for failure to get a called party. He charges 3½ cents per call on all over the 30 calls per month. The subscriber reads the meter at the end of the month.

If any of the flat-rate subscribers want a meter Mr. Griffin charges them for the meter. "After you get about all the meter subscribers that you think you should have (as all telephone men know their town), make a charge for the meter of, say, $2.50 to $5," says he.

In every town there are people who for different reasons do not have a telephone, which the meter catches, Mr. Griffin states. "It will get back almost all your discontinued subscribers; will reach those who do not need telephone service enough to pay the flat rate, those who are not able to pay a flat rate and those who can and do not want to pay the flat rate," says he.

"It causes subscribers to appreciate their telephones more because they have more persons they can talk to; makes them more friendly to the service, because of increase in subscribers," he continues. "It also creates a good feeling among the subscribers and public to know a telephone man is enlarging his subscribers' list."

In January the calls of 34 metered subscribers of the Valley Mills exchange varied from three to 55 each, and only six ran over the minimum allowed; in December only one subscriber exceeded the minimum.

Mr. Griffin will gladly supply complete information concerning his Telometer and its operation.

▼ ▼

Recent Prices in the Metal Markets

New York, N. Y., April 12: Copper—Steady; electrolytic spot and future, 15.50c per lb.; export, 15.16c. Tin—Easier, spot and nearby, 60.00@ 60.12½c per lb.; future, 59.50@62½c. Lead—Steady, spot New York, 6.00@6.05c per lb.; East St. Louis, 5.95c. Zinc—Steady; East St. Louis, spot and future, 7.00c per lb.

WORRY

By MISS ANNE BARNES

Traveling Chief Operator, Iowa Independent Telephone Association, Des Moines, Iowa

A CHIEF OPERATOR wrote to me recently, "I sometimes think I would rather go back to my switchboard position where I had no worries to burden me after hours as my chief-operator duties do."

Someone has defined "worry" as the iron that enters into one's soul. When we think of iron we mentally see such things as bullets, iron bars, old iron fences surrounding the grounds of fine old mansions of other days, all made of this strong metal.

Iron in the soul has no definite or helpful purpose. It cuts like a two-edged sword as long as we permit it to remain there. Worry is iron in the soul and offers no helpful suggestions. It prevents us from thinking of a way out of a difficulty.

Have you ever awakened in the night and suddenly thought of something you failed to do in your business that might the following day reflect on your record for efficiency, and possibly cause trouble? There you are in your bed in the middle of the night, several blocks probably from the office where the record you are worrying about is kept.

You could go back to sleep if you were sure you had attended to some important detail but worry keeps you *doubting*. Over and over you re-enact the whole situation and every time you come out just where you started. You wish it were morning; but when it is time to get up, you are weary from lack of sleep and purposeless use of nervous and mental energy—and you are still worried.

When you *begin* to worry about a thing you cannot clear at the time, concentrate on the uselessness of worry until this thought seems more important than the difficulty you will face and clear tomorrow. Think of worry as just a common thief that wants to steal your sleep, your energy, and your mental fitness for tomorrow.

If you try to do this you will soon adjust yourself to what cannot be helped tonight, and so win the victory over worry. Your reward will be *peace of mind.*

Condensed Telephone News

New Companies and Incorporations

BATH, ILL.—A charter has been issued to the Bath Telephone Co. to operate a telephone company for the village of Bath and surrounding territory. Capitalization was set at 10 shares.

Incorporators are Kenneth Blodgett, Genevieve Blodgett and Helen Allen.

INDIANAPOLIS, IND.—The Livonia Telephone Co., Inc., R. F. D. 2, Campbellsburg, has been incorporated with a capital stock of ten shares of $100 par value. The object is to operate telephone lines.

Incorporators are Austin Colglazier, resident agent, R. F. D. 2, Campbellsburg; Hattie M. Colglazier, Ray M. Colglazier and Russell R. Colglazier.

ST. ANTHONY, IOWA—Renewed and amended articles of incorporation of the St. Anthony Mutual Telephone Co., by which the company is changed to a cooperative, non-pecuniary plan, have been filed in the office of the county recorder.

Under chapter 390-Gl of the code, memberships are sold and all net earnings of the company, after expenses are met, are placed in a revolving fund, credited to the members in the form of deferred payment dividends.

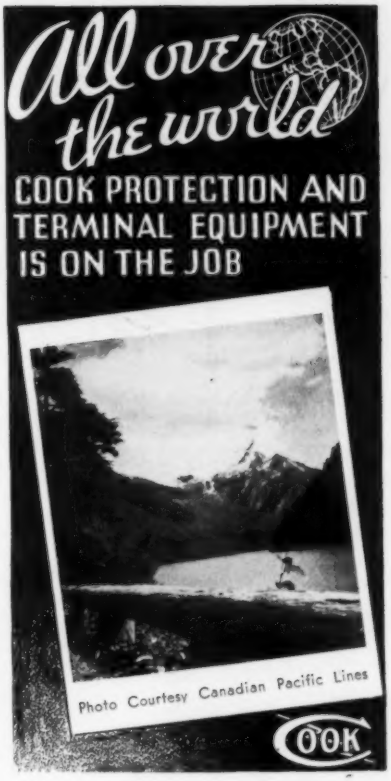
COZAD, NEB.—Northwestern Mutual Telephone Co. of Cozad, incorporated to give farm and rural service with an authorized capital of $3,850. Incorporators are D. H. Adle, Ernest W. Adie, W. L. Love, Worthy Bartlett and Guy Curtice.

PALMYRA, NEB.—Palmyra Telephone Co. incorporated with an authorized capital of $4,000 for the purpose of furnishing rural service. Incorporators are William Morill, H. L. Severs, Jos. Nash, Joy T. Copes and C. F. Reed.

BLACKWELL, OKLA.—A charter has been granted the Home Telephone Co., incorporated with no capital stock by W. E. Knapp, Perry Howell and C. F. Miller.

CLOVERDALE, ORE.—Application filed by the Cloverdale Telephone Co. for authority to change its name to "Tri-County Telephone Co.," with offices located in Portland.

The company also asked permission to



In ALASKA

—where distances are great and maintenance is expensive, Cook equipment is used for low cost operation and dependable service.

No. 7 LIGHTNING ARRESTER

A tight, compact cross-arm arrester with bakelite insulation.

Sample sent on request.

COOK ELECTRIC CO.
2700 Southport Ave. Chicago

Always Specify COOK PROTECTION

"Telephony's" Engineering Data

By B. C. Burden

Index, General.
April 17, 1937.
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Theory and Practice of the Magneto Telephone Exchange (Ctd.)

When a spring is rigidly fastened at one end, and the opposite end left free to vibrate, it has a characteristic or natural "period of vibration." The rate of vibration is a function of the stiffness of the spring, the length of the

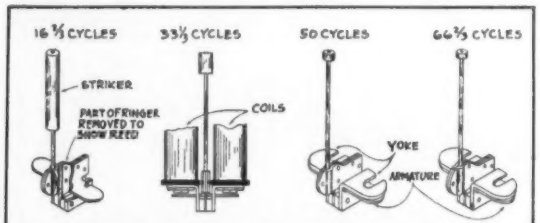

FIG. 21. REEDS AND TAPPERS FOR FOUR HARMONIC RINGERS.

tapper rod, or reed, and the weight of the attached tapper. Fig. 20 illustrates the construction of this type of ringer.

When only a small force having the same characteristic period or natural frequency as the reed is applied, it will vibrate vigorously, while it will respond only slightly, if at all, to other frequencies. Fig. 21 shows the several type reeds and tappers used to obtain selective ringing at different frequencies. Note the difference in size of the tappers.

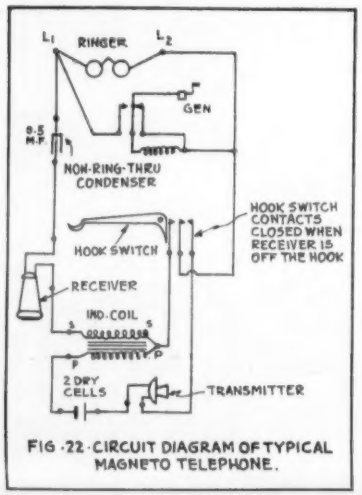

FIG. 22. CIRCUIT DIAGRAM OF TYPICAL MAGNETO TELEPHONE.

The unusual phenomena just described permits

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selective signaling on party lines. That is, if a number of harmonic ringers having different frequencies are bridged across a party line, any desired ringer can be selected by passing an alternating current of the proper frequency over the line corresponding to the "period" or frequency of the particular ringer desired. The frequencies ordinarily used on present-day harmonic systems are 16, 20, 25, 30, 33, 42, 50, 54, and 66 cycles.

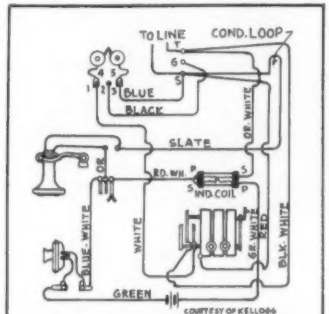

FIG. 23. PICTORIAL OR WIRING DIAGRAM OF MAGNETO TYPE WALL TELEPHONE.

Some ringing systems permit a full selective system using the frequencies mentioned by connecting five ringers from each side of the line to ground. Thus, giving a ten-party full selective ringing system. Some of the older harmonic ringing systems use frequencies of 16⅔, 33⅓, 50 and 66⅔ cycles. Such systems give some trouble due to the fact that the several frequencies are multiples of each other and there is a tendency for a ringer to respond to frequencies which are multiples of fundamental frequency of ringer.

Fig. 22 illustrates the most common type of circuit employed in magneto wall telephones. In studying this circuit, it will be seen that the ringer is bridged directly across the line terminals, L_1 and L_2; likewise, the generator is bridged across the line terminals but is disconnected from the line by the automatic shunt spring arrangement when not in use.

The receiver is connected in series with the secondary winding of the induction coil and one of the line terminals. When the hook switch is operated, this connects the common point of the secondary and primary winding of the induction coil to the line and at the same time closes the battery circuit, allowing current to flow in the transmitter and primary winding of the induction coil.

In Fig. 22, known as a *schematic diagram*, the various connections to the component parts of the telephone are run

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in the most direct manner so as to present a simple, understandable diagram. A wiring diagram which shows the approximate position of the parts and the connecting wires between them, is shown in Fig. 23. It will be noted that it is much more difficult to analyze a circuit of this type, from the standpoint of seeing just how the various component parts are associated together electrically.

The modern telephone utilizes what is known as "form wiring"; that is, a braided insulation type wire is used for connecting the various component parts. The wires are fastened together by means of a waxed cord in the form of a cable which is held against the backboard of the set by cleats. Fig. 24 shows a typical wiring form used in magneto wall telephones.

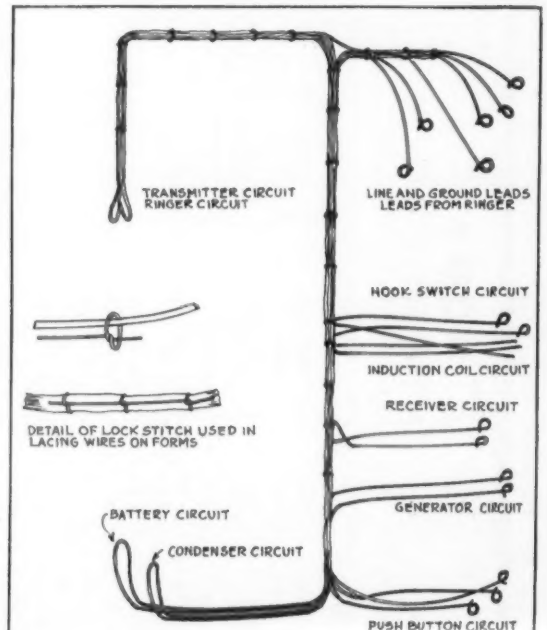


FIG. 24. WIRING FORM USED IN MAGNETO SUBSCRIBERS' WALL SETS.

decrease its capital stock from $10,000 common and $20,000 preferred to $10,000.

DIXIE, WASH.—Articles of incorporation have been filed by the Dry Creek Telephone Co., capital stock, $1,000, for authority to construct and maintain a telephone system. Incorporators are P. S. Aldrich, George Cochran, James Stonecipher, Arthur Kershaw and J. C. Melger.

Financial

TAMPA, FLA.—Directors of the Peninsular Telephone Co. have declared three dividends of 40 cents a share, payable April 1, July 1, and October 1. On January 2 the company disbursed a dividend of 25 cents a share.

JERSEY CITY, N. J.—The board of directors of General Telephone Allied Corp. on April 6 declared a dividend of $4 per share on the $6 preferred stock of the corporation, payable May 1 to holders of record at the close of business on April 15. This dividend is a payment on arrears for the period March 1, 1936, to October 31, 1936, inclusive.

Telephones

CHICAGO, ILL.—The Illinois Bell Telephone Co. had 5,098 more telephones in use in Chicago at the end of March than a month earlier. This compares with an increase of 4,523 in the preceding month and a gain of 4,526 in March of last year.

The increase in the first quarter this year was 15,419 as compared with 11,826 in the corresponding period of 1936.

At the end of March, 914,561 telephones were in use in the city the company reports. This contrasts with the low in the depression of 793,546 in August, 1933, and with the high of 999,390 in April, 1930.

NEW YORK, N. Y.—The New York Telephone Co. reported that the March station gain was 13,961, compared with a gain of 9,406 in March, 1936; 2,524 in March, 1935; 4,781 in March, 1934; and a loss of 19,163 in March, 1933.

In the first quarter, the station gain was 38,172 against a gain of 22,054 in 1936 period; 2,463 in 1935 quarter; 6,711 in 1934 quarter and a loss of 56,342 in 1933 quarter.

CINCINNATI, OHIO—Stations operated by the Cincinnati & Suburban Telephone Co. totaled 169,165 on March 31, a gain of 3,245 for the month and 9,983 over March 31, 1936. Part of the March gain was reinstallation of telephones disconnected during the January-February flood.

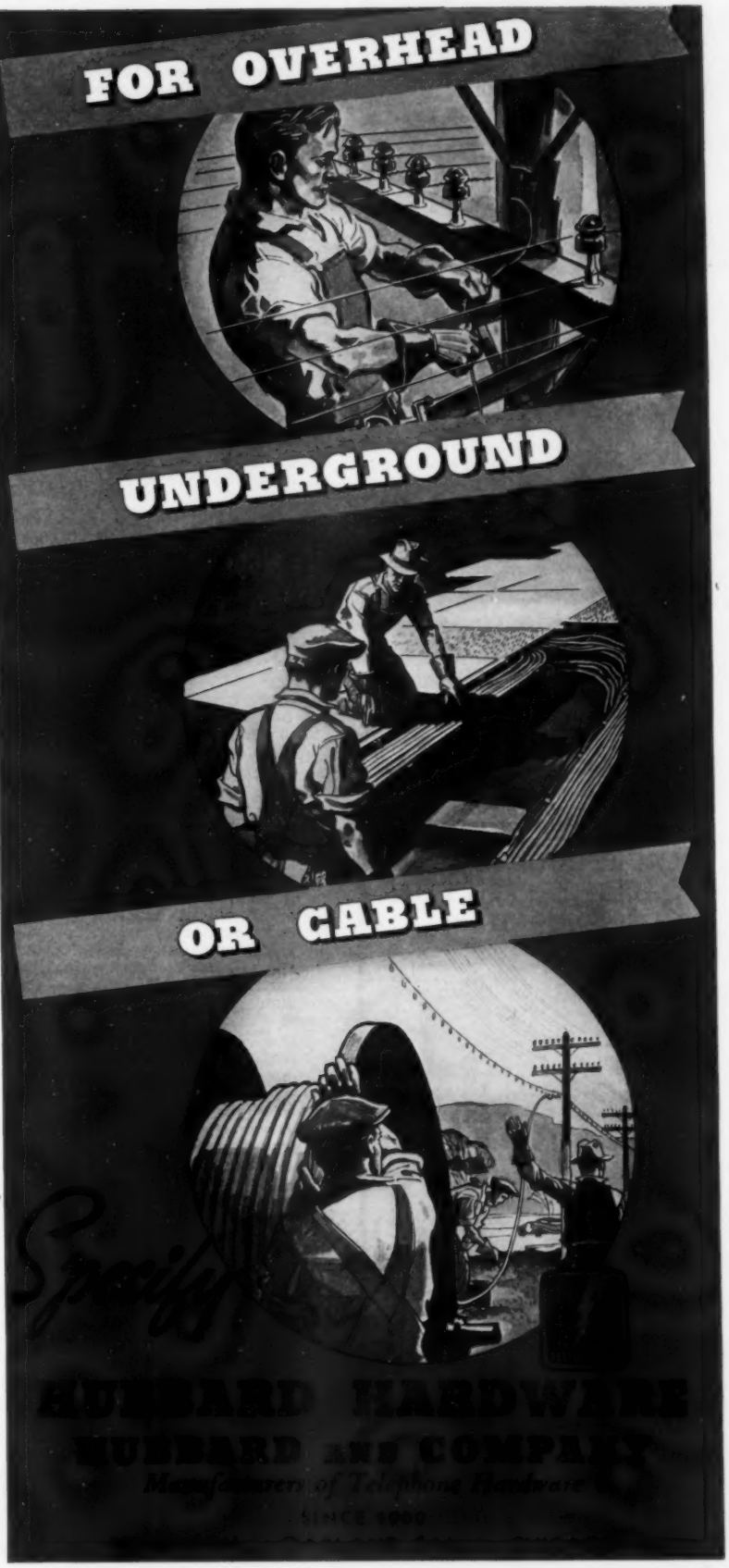
PHILADELPHIA, PA.—The Bell Telephone Co. of Pennsylvania reports a net gain of 9,032 telephones in service for March, making a net gain of 28,262 for the first quarter of this year. The January gain was 8,948 and the February gain 10,282.

For March, 1936, the company reported a net gain of 4,751, and for the 1936 first quarter a net gain of 13,173.

As of March 31, 1937, there were 1,163,162 Bell telephones in service in Pennsylvania, compared with 1,084,673 in service on March 31, 1936.

Construction

METROPOLIS, ILL.—The Illinois Commercial Telephone Co. is endeavoring to restore telephone service in Massac County as soon as possible by repairing and replacing damaged wires, which suffered first from an ice storm, then from



floodwaters which inundated many of the wires and caused poles to be uprooted over large areas.

INDIANAPOLIS, IND.—The Indiana Bell Telephone Co. will begin construction of a new "Broadway" exchange at 5862-80 College avenue this spring with plans for its operation early in 1938, officials of the company have announced. The building is expected to cost more than $80,000.

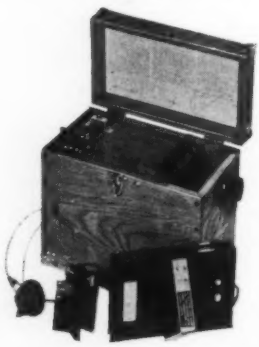
Rapid growth of the city northward has made establishment of the new central office on the north side the most economical and efficient means of providing adequate telephone facilities for the district.

INDIANAPOLIS, IND.—The Indiana Bell Telephone Co. has underway a large cable project estimated to cost $106,000 including repairs and rearrangements. It includes replacement of the existing Indianapolis northwest toll entrance cable and heavy open wire sections of the two important toll lines along State Road 29 with underground composite cable along Kessler boulevard, and the extension of exchange facilities in Crow's Nest and north of Seventy-first street in Pennsylvania street.

A total of 62,093 feet, almost twelve miles of cable, is being used in connection with the project. Over 20,000 feet of the cable will be underground. In addition the job calls for 174 poles, 78 crossarms, 75 terminals, 38 load coil cases, 7.06 miles of iron wire, 83,459 duct feet of conduit, and 36 manholes.

GILMORE CITY, IOWA—A $7,000 project of the Northwestern Bell Telephone Co. has been begun here involving the placing of 77 poles, 7,227 feet of cable and seven miles of aerial wire.

THE NEW STEWART CABLE LOCATOR AND CABLE TESTER COMBINED



Locates exactly where cable is buried in the ground and just how deep the cable is in the ground.

Locates shorts, crosses, grounds and wet spots in all kinds of cables. Has balanced exploring coil that will not pick up tone on the cable sheath.

STEWART BROTHERS
OTTAWA, ILLINOIS

TROY MILLS, IOWA—The Farmers Mutual Telephone Co. has purchased a new switchboard.

LEXINGTON, KY.—The Lexington Telephone Co. has just completed the replacement of 820 feet of 800 and 2,400-wire underground cables on north Upper street from Third to Fifth streets. The job was begun last July.

It was necessary to replace the cables, which originally were laid a number of years ago, because earth currents returning from the trolley lines throughout the city to the power station had followed the underground cables in as they offered a better return path than the earth itself. As a consequence, the lead sheaths of the cables were subjected to electrolytic action and resulted in pitting of the sheaths.

To protect the new cables from similar damage by electrolysis, drainage wires have been connected with the power station to remove the earth currents. Also, recording meters will be used at intervals in the future to verify the effectiveness of this current-drainage system.

BISMARCK, N. D.—An expenditure of $16,000 and approximately 3,600 man hours of labor will be required to complete a telephone construction project recently begun here by the Northwestern Bell Telephone Co.

Additional telephone facilities for certain sections of the city will be provided and several sections of open wire lines will be removed from the streets.

VALLEY CITY, N. D.—The Northwestern Bell Telephone Co. plans to erect a $15,000 exchange building here.

BELLEVUE, OHIO—Details of plans for improvements at five exchanges of the Northern Ohio Telephone Co. have been announced by William C. Henry, secretary and general manager. Total cost of the program will be approximately $100,000.

New automatic equipment will be placed into service in Bowling Green about October 1 as the climax of a $60,000 improvement program in that city. The company plans to expend more than $35,000 installing new automatic exchanges at Cheshire, Lewis Center, Ostrander and Kilbourne in Delaware county.

BRYAN, OHIO—The Ohio Associated Telephone Co. has repaired about 50 telephone poles broken during a sleet and wind storm in late March which disrupted service on 12 toll lines.

CAMDEN, OHIO—Fifty miles of wire have been strung by employes of the Ohio United Telephone Corp. because of damage caused by storms, according to E. G. Morgan, local manager. He said sheeting of ice on the wires, and high winds had caused extensive damage.

LIMA, OHIO—Officials of the Lima Telephone & Telegraph Co. have announced $15,000 soon will be expended to improve telephone service in and near Westminster, near here. They said 24-hour dial service will be inaugurated there, with free communication to and from Lima.

SCIO, ORE.—Several hundred dollars in work and materials were recently spent on the Scio Mutual Telephone Co. plant here. Heavy snow and high winds played havoc with telephone and power lines. Tangled masses of wire and poles had to be replaced, and in some instances the debris interferred with highway traffic until removed.

RUTLEDGE, TENN.—The Rutledge Tele-

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Kennecott Wire and Cable Company, Subsidiary of Kennecott Copper Corporation (formerly American Electrical Works), Phillipsdale, R. I.—Paper telephone cable, switchboard cable, bare copper wire. Chicago office: 20 N. Wacker Drive; Cincinnati: Traction Bldg.; New York: 100 E. 42nd St.

POLES

B. J. Carney & Co., 100 N. 7th St., Minneapolis, Minn.—Western red cedar poles. Pentrex Butt Treated or Plain.

International Creosoting and Construction Co., Galveston, Texas.—Creosoted Southern Yellow Pine Poles. Plants: Beaumont and Texarkana, Texas.

MacGillis & Gibbs Company, Milwaukee, Wis.—Northern White and Western Red Cedar Poles. Plain or butt-treated. Immediate quotations on request.

T. M. Partridge Lumber Co., Minneapolis, Minn.—Northern White—Western Red Cedar Poles. Plain or butt-treated.

H. Sigalet & Company, Ltd., Lumby, B. C., Canada—Western Red Cedar Poles. Plain or butt-treated.

Valentine Clark Corporation, 2516 Doswell Ave., St. Paul, Minn.—Finished Cedar Poles. Plain or butt-treated.

phone Co. is extending its line to Buffalo Springs. This line will make service available to a number of farmers who have not had telephones.

MADISON, S. D.—The Dakota Central Telephone Co. has begun an improvement program in Madison which will cost an estimated $20,000 to $25,000, according to C. H. Atkinson, local manager.

Wayne Sherman of Arlington, construction foreman, is in charge of a crew of seven men to do the work.

ALICE, TEXAS—Construction plans of the Southwestern Bell Telephone Co. include a new $67,000 exchange building here, together with the installation of a new switchboard and other equipment.

GATESVILLE, TEXAS—The Gulf States Telephone Co. occupies a new $7,500 building here.

ANAHUAC, TEXAS—The Chamber County Telephone Co.'s improvement plans for this year include a new switchboard, the installation of about 6,000 feet of lead cable and new telephone poles for Anahuac and Devers, at an estimated cost of $6,000. C. G. Mendenhall is owner of the company.

MILWAUKEE, WIS. — The Wisconsin Telephone Co. plans to expend approximately $4,000,000 during 1937 for construction and replacement of telephone plants in various parts of the operating territory. The company's expenditure for construction and maintenance in 1936 was approximately $3,000,000.

Mr. Danner announced that the company right now is in the midst of a broad expansion and improvement program involving the expenditure of many thousands of dollars. The company is planning 10 years ahead, he said, extending its lines into communities that will be developed within the near future.

Elections

FELTON, MINN.—Ed Johnson is president of the Felton Rural Telephone Co., Bert Sunde, vice-president; I. S. Stenerson secretary and treasurer, and Selmar Dalen, manager.

ELYRIA, OHIO—At the recent election of the Elyria Telephone Co. A. J. Curran was elected president; H. O. Dutter, general manager and secretary; H. C. Harris, vice-president and treasurer; and Mrs. Clara P. Robson, widow of the late J. Edward Robson, was elected to the newly-created position of assistant secretary-treasurer.

PHILADELPHIA, PA.—The Bell Telephone Co. of Pennsylvania has elected three new directors to vacancies. They are: Arthur C. Dorrance, president of the Campbell Soup Co.; Walter S. Franklin, vice-president of the Pennsylvania Railroad, and Ralph E. Weeks of Scranton, president of the International Correspondence School.

DARLINGTON, WIS.—At the annual meeting of the Lafayette County Telephone Co., M. J. Laverty was re-elected president of the company; Harvey White, Fayette, was elected vice-president; John W. Rielly, Darlington, secretary, and Bert McGranahan, Argyle, treasurer.

Reports by the secretary showed that the volume of business for the past year was larger than any preceding year.

WEST SWEDEN, WIS. (P. O. Frederic) —Carl Peterson has been elected president of the West Sweden Telephone Co., John Larson, vice-president, and Edith Moline, secretary-treasurer. Alfred Olson was re-elected director.

Miscellaneous

ALTA VISTA, IOWA—The Alta Vista Farmers' Telephone Co. has sold all its interests to the Piehn Telephone Co. of Alta Vista, effective April 1. The Farmers' company was organized here more than 30 years ago and had approximately 110 stations.

LAMBERTVILLE, MICH.—Jay Phillips, of Tontogary, Ohio, is the new manager of the Farmers Telephone Co. here succeeding his son, Arthur Phillips who became associated with the Western Electric Co. in Chicago April 1. He has been manager of the company for the last four years.

ROCK CREEK, OHIO—William McCluskey of Bedford, former Ohio Bell employe, has purchased the controlling interest in Citizens Telephone Co. here.

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Western Elec. No. 22 3-bar Bdg. Gen. complete with crank and screws @	1.85
Leich Elec. Local or C. B. Transmitters with New mouthpiece and Back @	.90
Kellogg No. 729 S. A. Straight line C. B. wood hotel sets with Booster coil @	6.75
Kellogg No. 2696 4-bar 1000 or 1600 ohm Bdg. compacts with short arm @	8.00
Chicago Telo. Supply or Am. Elec. Receiver with repolished shell and new cords @	.90
Monarch No. 33 desk set with 3-bar 1000 or 1600 ohm inside connection signal set @	7.85
Automatic Elec. Co. 2 M. F. Condensers @	.35
Western Elec. No. 21 1 M. F. Condensers @	.35
Model No. 6 Style C. Flush type Calculagraphs, spring driven. @	26.50
New Cook No. 44 H Wall type Protector rack with GG No. 10 Cross connecting strip, 20-line units complete with Fuses and Carbons and mounting brackets @	7.50
New Kellogg C. B. or Magneto Grabaphones complete with 3 Cond. Cord less signal sets @	7.25
Western Elec. Cordless Visual signal C. B. PBX board with 7 local lines and 3 trunks complete with desk set Opr. set @	100.00
Chicago Telo. Supply Local Battery Ind. coil, 3 connection type @	.35

Write for Bulletin

REBUILT ELECTRIC EQUIPMENT CO.
1940 West 21st St., Pilsen Sta.
Chicago, Ill.

TELEPHONY ADVERTISERS
will give you service which will be pleasing

Reconditioned Switchboard Jacks

Lamp
Answering
Multiple
Individual
Combined Drops and Jacks
Lamps and Lamp Caps

BUCKEYE TELEPHONE & SUPPLY CO.
COLUMBUS, OHIO

NEW STYLE STEWART CABLE TESTERS

With balanced coil. Locates shorts, crosses, grounds and wet spots; also tone circuit.

$54.00 Sent on trial.

STEWART BROS.
Ottawa, Ill.

HELP WANTED

WANTED—Plant Superintendent with general experience with Kellogg switchboards, cable plants, construction work and general outside plant to take care of nine Florida exchanges, two common battery and seven magneto with approximately 4,000 stations. Please communicate with W. E. Glisson, General Manager, Southeastern Telephone Co., Tallahassee, Fla.

WANTED—Accountant, age 25 to 35, preferably with telephone and some auditing experience. Address handwritten application to Telephone Engineering & Construction Co., Dime Savings Bldg., Lima, Ohio.

WANTED TO BUY

WANTED TO BUY—Telephone exchange, 200 to 500 subscribers. Address 8614, care of TELEPHONY.

POSITIONS WANTED

EXECUTIVE POSITION preferably with large operating company desired by telephone engineer with wide experience in dial systems, equipment, traffic and costs. Now employed. Address 8610 % TELEPHONY.

POSITION DESIRED by telephone engineer with executive experience, aged 38, college graduate, now employed in telephone engineering with 14 years' experience. Address 8564, care of TELEPHONY.

WANTED—Employment in telephone field. Ten years' experience in construction, switchboard maintenance, cable splicing and general trouble shooting. Can furnish reference. Address 8583, care of TELEPHONY.

POSITION WANTED by 1st class Cableman, 20 years' experience with Bell and Independent; or would accept job as manager of exchange. Address 8580, care of TELEPHONY.

Flashes and Plugs—News Briefs and Comments

It is estimated that telephone pay stations in the London (England) area are robbed of $1,500 monthly.

* *

The highest telephone wires in the world cross the Andes Mountains between Argentina and Chile in South America. They reach an altitude of 12,300 feet.

* *

The largest private branch exchange in Illinois outside of Chicago is in the Capitol building at Springfield. It serves 550 telephones.

* *

The total number of telephone poles in use in the United States would make a solid fence from New York to San Francisco.

* *

Of the 4,473,000 individual income tax returns filed in 1936, only 2,067,000 showed a taxable income. Think of the time and energy wasted in compiling the 2,406,000 non-productive returns!

* *

Here's a sidelight on taxes: If the Bell System paid no taxes it could raise wages $470 per year per employe, or reduce telephone charges $8.36 a year, or increase stock earnings $5.98 per share.

* *

The new telephone exchange recently opened in the Department of the Interior in Washington, D. C., is so large that 3,700 calls can be handled at once. Another example of the growing bureauracy.

* *

In the celebration of Chicago's hundredth anniversary it was brought out that the city had 455 telephones in 1878. Now there are 925,000 in the Chicago area.

* *

Bernard Shaw is quoted to the effect the the only book in which "obscenity" can't be found is the telephone directory.

* *

In 1936 the Ohio Bell gained 50,500 telephones and paid in taxes $9.23 for each station in service. The company had a net income of $10,278,716—a new high record—and paid the A. T. & T. $10,075,000 in dividends.

* *

Strikes of telegraph messengers in a number of cities led office managers to telephone the telegrams to those addressed.

IT IS EASY to hand this telephone across the desk. It can comfortably be carried to another room and plugged into that outlet. Only one hand is necessary for it is easy to grip and light to carry. The women folks will be especially pleased for they can lift it with one hand while dusting the table or desk with the other.

Because the Masterphone is so compact and easy to handle, you will have less breakage and find it much easier on maintenance. You will also like it better from the standpoint of transmission, reception and ringing efficiency. And most of the parts in this set are *interchangeable* with those of other "900" series Masterphones, and can be added or subtracted at any time to meet any condition. Then, too, the NON-POSITIONAL transmitter comes to you without extra cost making this the finest Combination set you can buy.

KELLOGG SWITCHBOARD AND SUPPLY COMPANY
1066 WEST ADAMS STREET CHICAGO, ILLINOIS

KELLOGG Masterphone

BRITISH INSULATED CABLES LTD.

Manufacturers of all types of bare and insulated cables and overhead conductors, for the transmission and distribution of electrical energy, including allied accessories and house wiring systems, also aluminum and copper sheets and sections, electric resistance welders and rivet heaters, lead strip and glazing sections, meters, rail joint bonds, static condensers, etc.

RECORD TRADING OF PROGRESSIVE CONCERN

BONUSES FOR STOCKHOLDERS

The Forty-first annual meeting of shareholders of British Insulated Cables, Ltd., was held at Exchange Station Buildings, Liverpool, on Friday, April 2nd.

Sir Alexander Roger, Chairman, presided over a good attendance of shareholders.

The Chairman, moving the adoption of the report and accounts, said: The past year's trading has established a record for the Company both in sales and in volume of output. Under 50 headings into which our various manufactures are divided for statistical purposes, as many as 43 show the highest figures for all time. Our turnover during the year shows an increase of 32.5 per cent over the previous year, and an increase over 1934 of 54.9 per cent. Whether measured by the volume of our turnover or by the variety of our products, we are comparable in size with the largest of the Cable Making firms in the world.

IMPROVED RESULTS

The net result of our trading shows an increased profit of £93,000 compared with 1935, and of £207,000 compared with 1934. These increases are not attributable to higher profit rates, but are the result of greatly increased turnover, made possible through the installation of additional plant, the expenditure of large sums during recent years in the continued modernization of our factories, and last, but not least, because of really hard work on the part of all concerned.

The average rate of profit that we obtain upon our turnover shows a remarkable consistency from year to year, and this of course points to the fact that the substantial reductions in cost that we are continually achieving are passed on, in effect, to the public. This is, we think, as it should be.

From a manufacturing point of view 1936 may indeed, as in the case of 1935, be described as a year of Works and Plant extensions and improvements, following research and developments relative to the Company's products and co-ordination with our Subsidiary and Associated Companies.

You will observe that our Profit on Trading is struck after "Contingent Reserves Adjustment," a phrase which has not hitherto been used. In businesses of our magnitude there are from time to time large transactions which cannot be settled in a single period of twelve months, and we have attempted in these cases to adjust their results known or anticipated, to accord with the period under review.

If to the profit of £765,695 the balance brought forward of £303,860 be added, we have a total of £1.069,555. After providing for interest on Debenture Stock, dividends on both classes of Preference Stock, Interim Dividend on Ordinary Stock and Directors' fees, there remains the sum of £874,561 to be dealt with.

DIVIDEND AND BONUSES

We have allocated to Depreciation a total of £143,681/14/2. It is also proposed to set aside the usual amount of £100,000 to Reserve Account, leaving a balance of £630,879, out of which we recommend a final dividend of Ten per cent to be paid on the Ordinary Stock, making with the interim dividend already paid, fifteen per cent for the year, and your Board feel justified in recommending a repetition of the payment of a cash bonus of Five per cent. These payments will be subject to income tax, and will leave a Carry Forward of £380,879, compared with £303,860 brought in.

At our last meeting I mentioned that a share bonus distribution had been suggested in some quarters, and I then informed you that your Directors did not think this altogether prudent. Our hesitation arose from the consideration that a bonus of this kind must be paid at the expense of the Reserves, and a consequent weakening of the Company's position in that respect is not advisable in face of growing competition, and the need to be able to meet all contingencies and maintain our stability. An additional consideration in our minds was the fact that bonus shares necessarily cause a weakness in the Company's position relative to the maintenance of the current rate of dividend.

These considerations are still before us, but we have decided that in view of the Company's further improved condition and immediate prospects, the payment of a share bonus at this time would be justified. We therefore propose to ask you at an Extraordinary General Meeting to be held after this Meeting, to increase our ordinary capital to £2,000,000, to sanction the capitalisation of £333,334 of the Company's reserves, and to appropriate that amount in paying up in full the like amount of new Ordinary Shares which, when converted into Stock, would be distributed as a bonus among the ordinary stockholders on the register at 1st May, 1937, in the proportion of £1 of Stock to every £5 of Stock now held. It is further proposed that the bonus shares in stock will rank for dividend as from the 1st January of this year. I may point out that this bonus has a market value much greater than the amount of stock distributed.

The Board have had prepared an estimate of the value of all investments and are of opinion that the intrinsic value is in excess of the value included in the Accounts.

WIDENED INTERESTS

Turning now to matters of more general interest, you will recollect that last year I intimated that the Board were investigating a form of rationalisation within the ambit of our own group of Manufacturing Companies. We have since purchased the undertakings and assets of the Macintosh Cable Co., Ltd., Derby, and the Croydon Cable Works, Ltd., Croydon.

In the past these Companies have been controlled by virtue of our shareholdings, but after a thorough investigation your Board decided to centralise and distribute manufacture at Prescot and Helsby Works. This will effect savings in works management expenses and in general establishment charges. Some extension of the buildings at Helsby has been necessary to house the plant taken over, and the opportunity has been taken to make provision for an increase in our manufacturing capacity, particularly in the direction of telephone switchboard cables, silk covered wires, etc.

British Copper Refiners, Ltd., continues to make good progress, and during the past year has substantially increased its output, measured in value and volume, and is proving in every way to be a very satisfactory auxiliary to your Company, both in a financial and manufacturing sense.

It will be interesting to you to know that your Company absorbs about 20 per cent of the copper of all kinds which comes into this country, and about 33 per cent of the copper used for electrical purposes.

FOREIGN RAILWAY ORDERS

International trade, though still beset with barriers and restrictions, is improving, and although we are exceptionally busy at home, we have no intention of neglecting our Overseas business. Three months ago, in conjunction with Metropolitan-Vickers Company, and the English Electric Company, we completed the first section of railway electrification in Poland, which comprises 179 miles of single track, and in Brazil, again in conjunction with Metropolitan-Vickers, we have actively in progress another contract for railway electrification extending to 112 miles of single track overhead equipment. This I may say is a type of work for which we have a high reputation. Our Order Books at present generally show an improvement on the past year, and the works both at Prescot and Helsby are working to capacity.

You are, of course, aware of the increasing prices of commodities. These affect our business mainly so far as rubber, copper and lead are concerned. When raw materials have advanced to this extent heavy additional finance is required, which would no doubt have represented a burden upon us had we not built up our reserves over years for this and other purposes.

PLANT WORKING TO CAPACITY

The present excellent showing made by the Profit and Loss Account has been arrived at largely by concentrated effort and by utilising the resources of the Company in men and plant almost to the breaking point. A large proportion of our machinery has been working double shift throughout the year, and in some cases even 23 out of the 24 hours.

One's natural comment on this is—"Why not expand further?" During the past year we have spent about £200,000 on capital account, and the work now in hand or in contemplation will probably involve us in a similar amount this year, but we cannot view the future with equanimity, and we are determined to guard against over-expansion of productive capacity. Your Board feel that it is dangerous to be carried away by excessive enthusiasm, on the crest of a wave of prosperity.

We all know that soon or late a period of less active trading may be expected to follow in the wake of the present conditions, and it has to be remembered that it is only a comparatively short time since the cable making facilities in this country were very considerably in excess of requirements. In all our capital expenditure we aim at so increasing our technical efficiency and reducing our costs of manufacture that in periods of depression, when the need is greatest, we may be strongly competitive. To this end also our financial reserves are directed.

In completing a survey of a year of extraordinary activity, I am sure you will join with me in tendering our cordial thanks both to the work people and to the staff for their loyal and efficient service, and in especial measure to our Managing Director, Mr. G. H. Nisbett, upon whom the burden of the very hard work necessary to bring about the results placed before you today, has chiefly fallen.

Mr. John Ferguson, Vice-Chairman, seconded, and the report and accounts were adopted.

Sir Alexander Roger, Mr. T. H. Martin-Harvey and Mr. W. Travis were re-elected Directors.

The Chairman and Directors were warmly thanked for their past year's services.

An extraordinary general meeting of the Company which followed authorised an increase of the Company's ordinary capital to £2,000,000 by the capitalisation of £333,334 of the Company's reserves, the new shares to be distributed among the ordinary stockholders in the proportion of £1 to every £5 of stock now held.